

# Successful Methods

Construction • Road Making • Engineering • Industrial • Mining



**“Home”**

**Vol. 2**

**December 1920**

**No. 12**

# THE CLYDE LINE

Steam Hoists  
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Gasoline Hoists  
Belt Hoists  
Derrick Fittings  
Steel Derricks  
Excavators  
Traction Cranes  
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# Successful Methods

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Vol. II

December, 1920

No. 12

## HOME

"Foracre Farm"—That's the name a friend of ours calls his home;—three acres of land and a fourth acre greater than all: an acre of peace, happiness and contentment.

It is this unseen area that really makes a home—be it a gorgeous house on the boulevard, or a wee cottage in the country, 'tis the area of peace, happiness and contentment that makes the home and life with its work worth while.

December and its holiday season are at hand, and Successful Methods, and the men who make it, wish its readers and their loved ones an ever expansion of the unseen area of the home.

Our New Year's Pledge—we are still a bit old fashioned you see—is to endeavor in the year that is coming to serve *you* better so that you will more easily acquire the means to enlarge that unseen area of *your* home.

*This Magazine Will Be Sent to Men Who Can Use It*



## EDITORIALS

## Get Your Materials on the Job Early

**R**OAD BUILDING can only proceed smoothly—and smoothly means profitably to the contractor—when the flow of materials such as sand, gravel, cement, steel, lumber, etc., is uninterrupted. Nothing eats up profits so quickly as a construction plant standing idle because of a shortage of materials with which to work.

Many a contractor has lost money on a job because he was tied up by the failure of his materials to arrive. The best way to avoid such a state of affairs is to get the materials on the ground just as early as possible. There was a time when this was not feasible because the average contractor was not able to tie up his money in a lot of materials and then wait for reimbursement until the job was finished.

That condition no longer exists in most of the states of this country. **SUCCESSFUL METHODS** has obtained and publishes in another part of this issue the habits and customs of the various state highway departments in the matter of paying for materials delivered on the site of the job.

Read what the state highway engineers have to say. You will find that on this point most of them are doing all they can to ease the contractor's burden. In a few states, such advance payments are prohibited by law, but in nearly all of these cases the engineers favor amend-

ment of the existing laws in order to permit the practice.

In two or three states, an exceedingly small minority, advance payments are not made and the engineers do not favor them.

The states which make advance payments handle the matter in many different ways, but the underlying principle is the same. They are all trying to make it easy for the contractor to build roads.

So if you are going to build roads next year, take advantage of the opportunity to get your materials on the job early. It will pay you and pay the public, too.

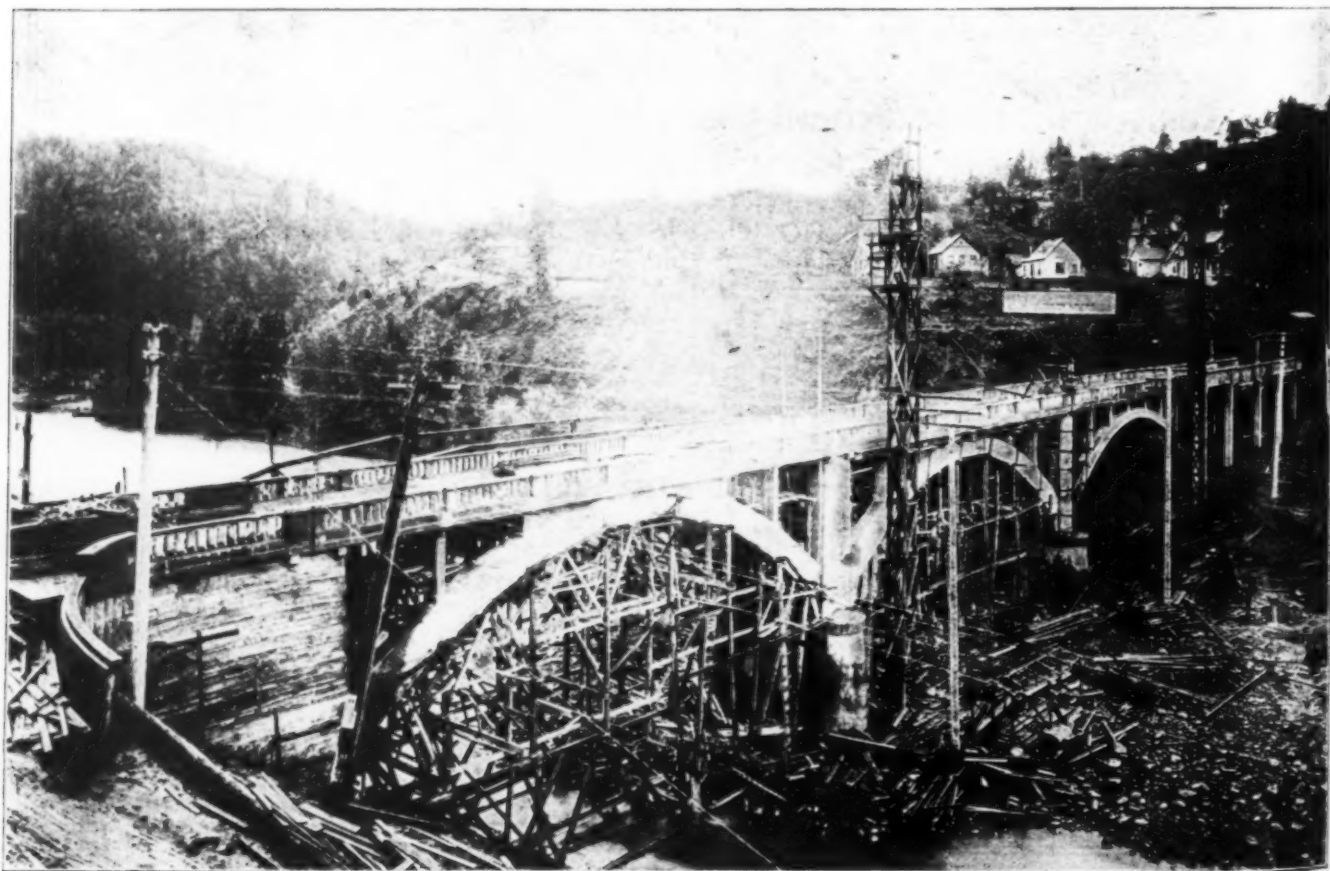
## That Income Tax

**A**S stated on page 19 of the November issue, **SUCCESSFUL METHODS** has started an Income Tax Service for its readers. This service is free. There are no strings attached. If there are any income tax problems that puzzle you jot them down on paper and send them in. They will be answered by experts.

Now is the best time to send in your questions. This is the month in which you close your books and your income tax to be paid next year will be based on what your books show on December 31, 1920.

Remember this Income Tax Service is free to readers of **SUCCESSFUL METHODS**. It is yours.

## A Reinforced Concrete Bridge on the Columbia River Highway in Oregon





## REMOVING A SHAKY STACK AT KEWANEE, ILL.

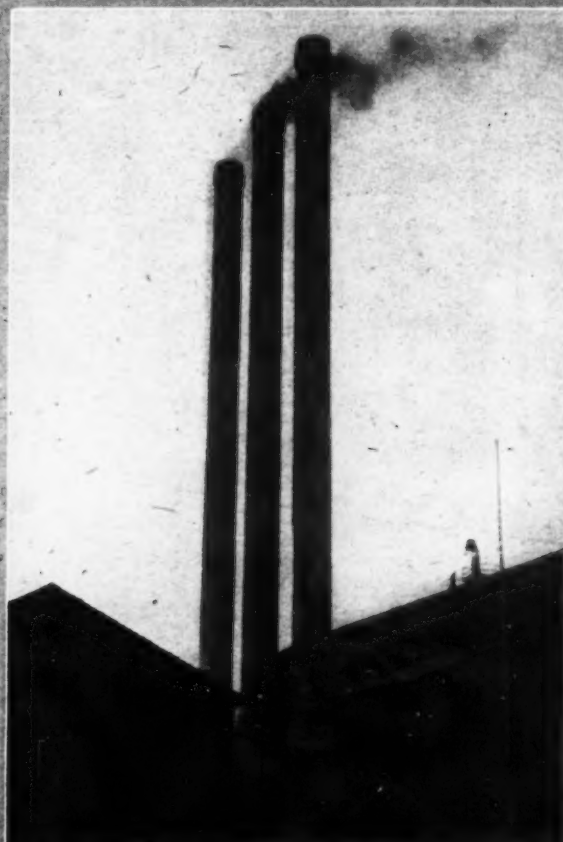


At the left: Breaking through the concrete covering which was put on the stack in an effort to preserve it.

Above: Cutting through the steel stack with an oxy-acetylene torch after the concrete coating had been removed.

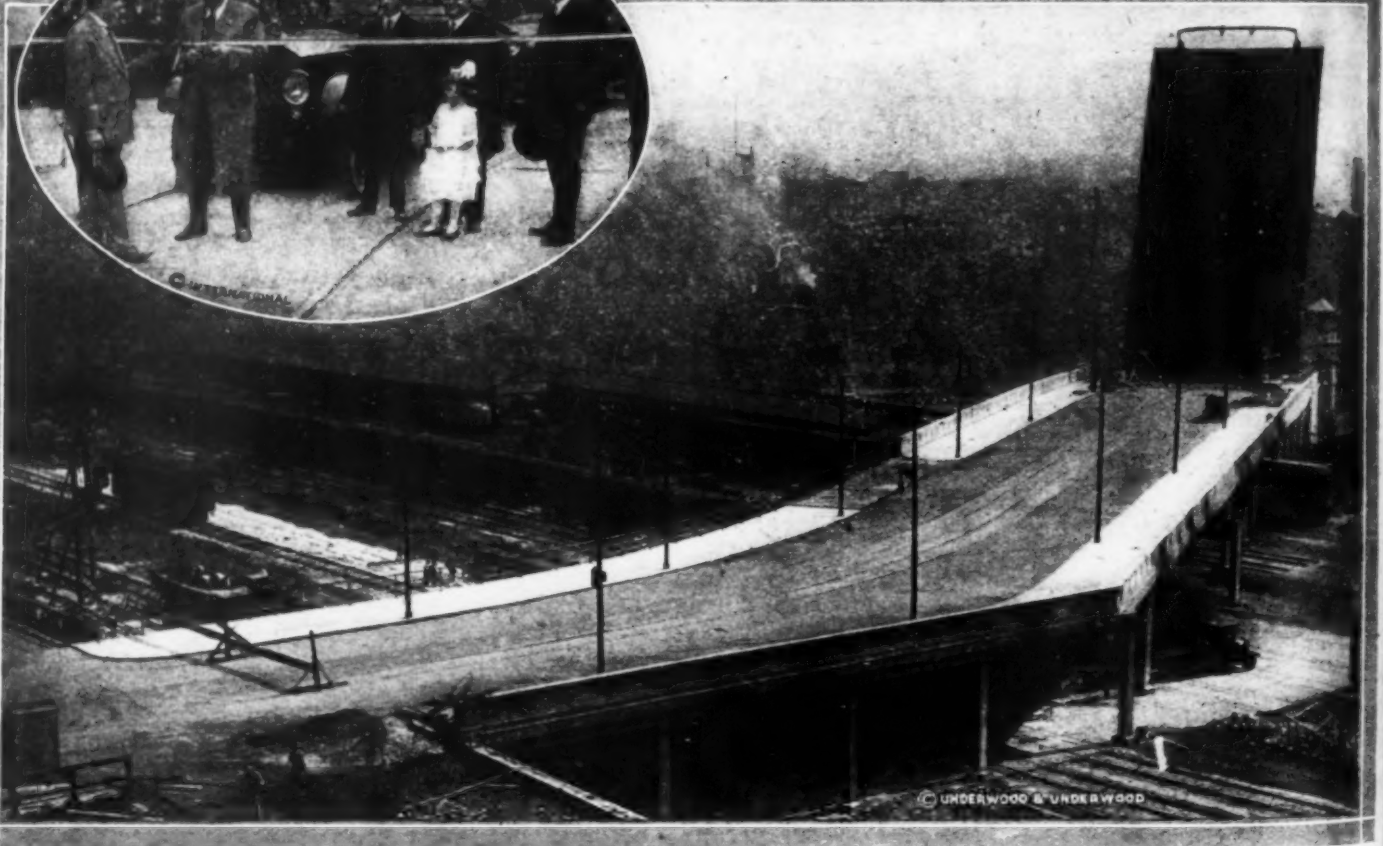
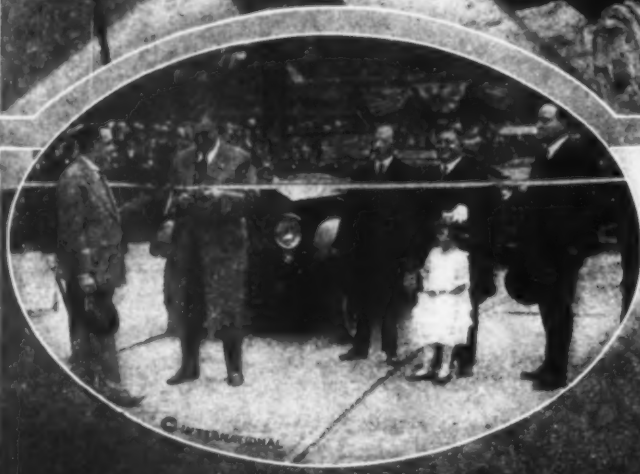
At the right: Three of the stacks, each 165 feet high, still standing. The concrete on one of them has been cut away preparatory to toppling it over.

Below: The fourth stack after it had fallen to the ground in exactly the position figured by the engineer in charge.



PHOTOS © UNDERWOOD & UNDERWOOD

## FOUR BIG PUBLIC JOBS



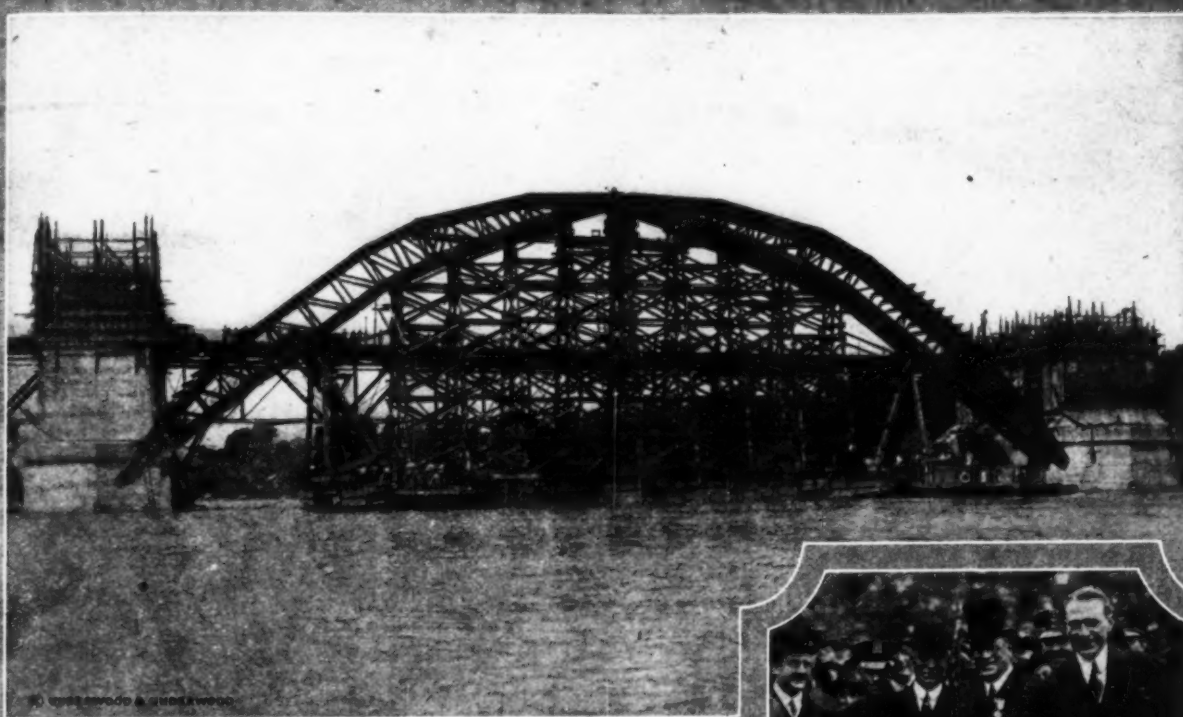
The photograph at the top of the page shows one of the automobiles running on railroad tracks used at the Hetch Hetchy Dam, now being built to furnish water for San Francisco. M. M. O'Shaughnessy, chief engineer and city engineer of San Francisco, is seated in front beside the driver.

The small photograph half way down the page shows Mayor William Hale Thompson of Chicago cutting the silken ribbon at the opening ceremonies of the new Franklin-Orleans street bridge over the Chicago River.

The lower photograph shows one of the approaches to the Franklin-Orleans street bridge, with one of the leaves raised high in the air.



## WHICH COMPEL ATTENTION



At the top of the page is a photograph taken while the steel span of the Key bridge across the Potomac River near Washington was being floated into place. This great span is 208 feet long and weighs about 200 tons. The other two pictures show the ceremonies incident to the beginning of the work on the Hudson River Vehicular Tunnel, which is to provide a passageway for motor cars and other vehicles between New York City and New Jersey. In the smaller picture, Lieutenant-Governor Walker of New York is shown wielding the pick and Governor Edwards of New Jersey is standing beside him with a shovelful of earth. The larger photograph shows the ceremonies in progress at the foot of Canal Street in New York City.



# ADVANCE PAYMENTS FOR ROAD MATERIALS

"Do You Pay in Advance for Materials Delivered on the Site of the Work?" Asked Successful Methods. "We Do," Answered Most of the State Highway Engineers

## ALABAMA

W. S. KELLER, STATE HIGHWAY ENGINEER

"**W**HEREAS our specifications do not provide for payment to contractors for material in advance of placement, we do make special provisions for such payments. There is no provision in our law prohibiting us from paying for materials when delivered on the job."

## ARIZONA

THOMAS MADDOCK, STATE ENGINEER

"**A**RIZONA has made no provision for paying contractors in advance of the completion of their work. The reason is that our department buys all of the cement, reinforcing iron, corrugated iron culverts, etc., used on highway work and most of the remaining material is obtained by the contractor close to the site of the work or in such a manner that they are not subject to much tying up of their funds during construction.

"To date most of our work has been the grading of the roads rather than paving so that this question has not been very material.

"There is no legal objection to our paying contractors for material before it is placed in the work. As a general proposition, we do not care to pay for lumber in concrete bridge form work because of its possible loss by fire, etc."

## ARKANSAS

V. P. KNOTT, STATE HIGHWAY ENGINEER.

"**T**HERE is no uniformity of practice in Arkansas in regard to providing for payment to contractors for materials delivered in advance of the completion of the work, but this method is being followed by many of the Road Improvement Districts who have direct charge of the work.

"Under some of our laws, advances of this kind are not permissible, but I see no objection to favoring amendment of the laws to provide for allowing the contractor a percentage upon materials stored upon the work, provided the owner is protected by certain restrictions, such as a sufficient retained percentage, protection and control of the materials."

## CALIFORNIA

AUSTIN B. FLETCHER, STATE HIGHWAY ENGINEER.

**T**HE following extract from the California statutes explains the state's treatment of this subject:

"Payments upon contract shall be made as the department of engineering may prescribe upon estimates made and approved by the said department and audited by the board of examiners, but no payment shall be made in excess of ninety per cent of the percentage of actual work completed, to which has been added one-half of the value of the material delivered on the ground and unused. The department of engineering shall withhold not less than ten per cent of the contract price until final completion and acceptance of the work. The controller shall draw his warrants upon estimates so made and approved by the department of engineering and audited by the board of examiners and the state treasurer shall pay the same."

## COLORADO

J. E. MALONEY, CHIEF ENGINEER, STATE HIGHWAY DEPT.

"**W**E are paying 8 per cent of value of material delivered. This is advanced as material is delivered and work is absorbed into the final payments of the contractors."

## CONNECTICUT

CHARLES J. BENNETT, HIGHWAY COMMISSIONER.

"**T**HIS department has continually made allowances for material on the job and, in fact, in some instances has assumed the cost of purchasing such material in order to keep the contractor going through these strenuous times.

"In general, our policy is to allow 85 per cent of a reasonable cost of the material, the 15 per cent retained being

for the usual safeguards against loss in handling, damage due to the weather, etc."

## DELAWARE

CHARLES M. UPHAM, CHIEF ENGINEER, STATE HIGHWAY DEPT.

"**W**E have been paying for material when delivered on the site of the work for nearly three years."

"At first we paid a certain percentage of the actual cost; later we allowed a certain percentage of the delivered cost. When the contractor purchased the materials, we took title to the materials at the time when we allowed estimates covering the cost of the materials. This was to do away with any future legal entanglement, if the contractor should fail or abandon the work.

"At the present time we are furnishing materials on a couple of contracts, but this does not work out very satisfactorily as we find the contractor is more wasteful with the state's material than he would be with his own. I think the most satisfactory way is for the state to purchase the material and sell it to the contractor at a certain price f. o. b. delivery. In this way, the state can carry the material accounts and the contractor is released to this extent in his financing.

"We are trying out this scheme on several contracts and it works very satisfactorily. We are able to purchase material cheaper than the contractor, as we have the credit of the state behind us. We have found that the delivery has been better than when the contractor furnished his own materials.

"By all means, I am in favor of allowing material estimates on all state contracts."

## FLORIDA

CHARLES A. BROWNE, STATE HIGHWAY ENGINEER.

"**T**HERE is no law forbidding the state to make advanced payments to contractors for material furnished or work done prior to the completion of any contract. In many instances, this department makes advances to contractors for material delivered on the site of the work."

## GEORGIA

W. R. NEEL, STATE HIGHWAY ENGINEER.

"**U**NDER the laws of this state we can and have, in some exceptional cases, paid the contractors for materials in advance of the completion of the work, but as a general rule, I do not think that this is advisable unless the conditions are unusual."

## IDAHO

D. P. OLSON, DIRECTOR, BUREAU OF HIGHWAYS.

"**U**NDER our contract specifications we make monthly payment to contractors of 90 per cent of the work done and, if they so desire, up to 50 per cent of the estimated value of acceptable materials necessary for the work delivered and unused."

## ILLINOIS

CLIFFORD OLDER, CHIEF HIGHWAY ENGINEER.

"**O**UR specifications carry the following clause: "Payment for Materials. The Department of Public Works and Buildings may, in its discretion, pay for any or all materials purchased and delivered for use in the work and said materials, when so paid for by the department, shall become the property of the department and in the event of default on the part of the contractor the department may use or cause to be used such materials in the construction of the work provided to be done in the contract. The amount thus paid by the department shall go to reduce estimates due the contractor as the material is used in the work."

"This clause provides for the payment of the cost of all material on unloading. We have followed this policy for the last year and one-half and I am pleased to say that the results have been very satisfactory."

## INDIANA

C. GRAY, ACTING CHIEF ENGINEER.

"THE State of Indiana has made no provisions for paying contractors for materials in storage before use in actual construction.

"Our present highway law does not permit the payment to contractors for materials in storage. We do favor, however, amendments of the state law to permit it.

"It is our opinion that paying for materials in storage would increase our yearly mileage of pavement laid more than anything else that could be done. This would permit the contractors to store materials during the winter months at which time more material is available than during the construction season."

## IOWA

FRED R. WHITE, CHIEF ENGINEER, STATE HIGHWAY COMMISSION.

"IN our specifications for road work we provide that at the end of any month estimates will be allowed the contractor on materials delivered at the site. Ninety per cent of the cost of such materials is being allowed."

## KANSAS

M. W. WATSON, STATE HIGHWAY ENGINEER.

"THIS matter is covered by the following paragraph from the specifications used in this state:

"At least once each month the Board will pay the contractor (on estimates approved by the engineer) 90 per cent (90%) of the actual cost of all materials delivered and accepted by the engineer. This material will be considered delivered when the following conditions have been complied with:

"Brick must be piled in neat piles adjacent to the road or near the unloading point and in a manner so as not to become covered with mud or dirt.

"Cement must be stored in sheds or buildings approved by the engineer as satisfactory protection against the elements and either near the point of unloading or in the vicinity of the work.

"Stone, sand or gravel will be considered delivered either when in storage piles at points approved by the engineer or

when delivered on the work; provided, that no payment will be made for aggregates scattered along the road during the months when work is not under progress where the aggregates may become unacceptable on account of the action of the elements or for other reasons.

"Other materials will be considered as delivered when stored so as to protect them from the elements to the degree deemed advisable by the engineer, either at the point of unloading or on the work."

## KENTUCKY

JOE S. BOGGS, STATE HIGHWAY ENGINEER.

"THIS department has not made any special effort or provision for allowing contractors consideration for material on site of the work. Owing to our present legislation, it is impossible for us to make payment for any material until same has entered into the construction of the road project. We feel, however, that, owing to the shortage of cars for shipping material, contractors deserve consideration, as it would enable them to store material which would expedite construction of road projects and would enable them to outline and plan their work to a better advantage."

## LOUISIANA

DUNCAN BUIE, STATE HIGHWAY ENGINEER

"WE do not care to commit ourselves as to a question of law and refer you to the Attorney General who no doubt will advise you what the law now permits."

## MAINE

PAUL D. SARGENT, CHIEF ENGINEER, STATE HIGHWAY COMMISSION.

"THIS Commission may, and ordinarily does, pay contractors for materials delivered on the site of work in advance of the completion of the work."

## MARYLAND

JOHN N. MACKALL, CHAIRMAN, STATE ROADS COMMISSION.

"THE State of Maryland pays the contractor in full less 10 per cent for any and all material delivered on the job in advance of the completion of the work."



ONE OF THE ROADS CONNECTICUT'S HIGHWAY DEPARTMENT BUILT.



**MASSACHUSETTS**

A. W. DEAN, CHIEF ENGINEER, DIVISION OF HIGHWAYS.

"THIS Commonwealth has made no provision for paying contractors for material delivered in advance on the site of the work. There are, however, no legal objections in this state to making such payments. If it were to be done, we would require the consent of the bondsmen and with such consent would feel safe in making such payments."

**MICHIGAN**

FRANK F. ROGERS, STATE HIGHWAY COMMISSIONER.

"THE Michigan State Highway Department pays estimates for materials delivered on the ground. However, certain exceptions are made in regard to cement."

**MINNESOTA**

C. M. BARCOCK, COMMISSIONER OF HIGHWAYS.

"BY provision of the specifications we have provided for paying contractors for concrete aggregate material and reinforcing steel when delivered in stock piles at the nearest railway siding adjacent to the work. Payment is made in regular monthly estimate for 85 per cent of the value of the materials delivered."

**MISSISSIPPI**

H. C. DIETZER, STATE HIGHWAY ENGINEER.

"NO provision has been made in this state for paying contractors for material in advance of completion of the work, for the reason that there is legal prohibition to it.

"Such payments being impossible under our existing laws, we are in favor of amending the laws so as to permit it. Wherever possible, we buy the material, such as gravel, sand, lumber, etc."

**MISSOURI**

ALEXANDER W. GRAHAM, STATE HIGHWAY ENGINEER.

"OUR state law does not permit us to pay for material in advance of the completion of the work, but I, personally, would favor amending the laws in order that certain building materials could be paid for in advance of being used in the work."

**MONTANA**

J. N. EDY, STATE HIGHWAY ENGINEER.

"LACK of state funds forces us to use county and Federal aid funds and Federal government will not pay on materials delivered, but not in place so we cannot. We should be glad to do so if funds were available. We pay 90% of work done on progress estimates."

**NEBRASKA**

GEORGE E. JOHNSON, SECRETARY, DEPT. OF PUBLIC WORKS.

"WE can pay for material out of our own general fund, but not out of the Federal Aid Road Fund. Therefore, whenever contractors need this money and conditions warrant such payment, money is taken from the general fund."

**NEVADA**

C. C. COTTRELL, STATE HIGHWAY ENGINEER.

"THIS department does not make payments for material delivered on the ground, but not incorporated in the work. Progress payments are made to the contractor monthly for the work which he has completed.

"It is impossible to make such payment as we are prohibited from doing so by our state highway law. We do not favor amendment of the laws to permit such payment.

"Our specifications are so written that the materials entering into the work are paid for at the contract unit price for the item in connection with which the material is used. For example, reinforcement steel is not paid for by the pound, but the cost thereof must be included in the contractor's bid price per cubic yard of concrete. On some of our projects which require a large amount of materials where it would be advisable to accumulate these materials in advance of construction, such as cement and aggregate for concrete paving, the state furnishes these materials to the contractor. This is the policy which has been pursued by

the department in connection with all paving contracts so that the contractor is not compelled to have a large investment in materials accumulated for the work."

**NEW HAMPSHIRE**

FREDERIC E. EVERETT, COMMISSIONER AND STATE ENGINEER.

"WE have made provisions to pay contractors a certain per cent of the cost of material in connection with contract work before the material is actually used in construction."

**NEW JERSEY**

T. J. WASSER, STATE HIGHWAY ENGINEER.

"NO provision has been made for paying contractors for material in advance of the completion of the work because the law does not permit payment on material not in place. The Legislature will be asked to amend the law so that it will be permitted."

**NEW MEXICO**

L. A. GILLET, STATE HIGHWAY ENGINEER.

"USUALLY we do not pay for material delivered on site of work although we do so sometimes in special cases, such as large bridges."

**NEW YORK**

FREDERICK STUART GREENE, COMMISSIONER OF HIGHWAYS.

PAYMENTS for materials delivered during the winter months are made as follows:

(a) For subbase and foundation materials delivered upon the work at the road allow not over 30 per cent. of the item price for the material in place, if such price is \$1.80 or more. Allow not over 40 per cent. if the item price for the material in place is less than \$1.80.

(b) For crushed stone for waterbound macadam top or bottom course delivered upon the work at the road, allow not over 40 per cent. of the item price for the material in place if such price is \$4.00 or more. Allow not over 45 per cent. if the item price for material in place is less than \$4.00.

(c) For crushed stone macadam top or bottom course delivered upon the work at the crusher site, allow not over 25 per cent. of the item price for macadam top or bottom course.

(d) Payments for crushed stone to be used in top course bituminous macadam will only be made for delivery upon the work at the crusher site, and material must not be hauled upon the road.

(e) For quarry or field stone delivered upon the work at the crusher for crushing for macadam top or bottom allow not over 15 per cent. of the item price for material in place.

(f) For quarry or field stone delivered upon the work at the crusher for crushing for cement concrete pavement, allow not over 8 per cent. of the item price for material in place under Item 57 and not over 12 per cent. of the item price for material in place under Item 57-B.

(g) For cast iron pipe delivered upon the work at the road, allow not over 75 per cent. of the item price for material in place.

(h) For bituminous materials delivered upon the work at the road, allow not over 60 per cent. of the item price.

(i) For drain tile pipe delivered upon the work at the road allow not over 50 per cent. of the item price for material in place.

(j) For brick delivered upon the work at the road, allow actual freight paid plus \$1.00 per M. for handling, plus \$2.00 per M. for each one mile haul.

FOR SAND, GRAVEL OR CRUSHED STONE DELIVERED UPON THE WORK AT THE ROAD FOR CONCRETE, CONCRETE PAVEMENT OR CONCRETE FOUNDATION.

(k) If the material delivered is local material then obtain the cost of the sand, gravel or crushed stone at the source of supply, add a hauling charge of 40c per mile per yard, and allow not more than 50 per cent. of the cost thus obtained.

If the material delivered is imported material and is delivered by railroad then obtain the cost of the sand, gravel or crushed stone at the source of supply, allow not more than 50 per cent. of the cost thus obtained, and pay the entire freight charge on the shipments as shown by the receipted bills.

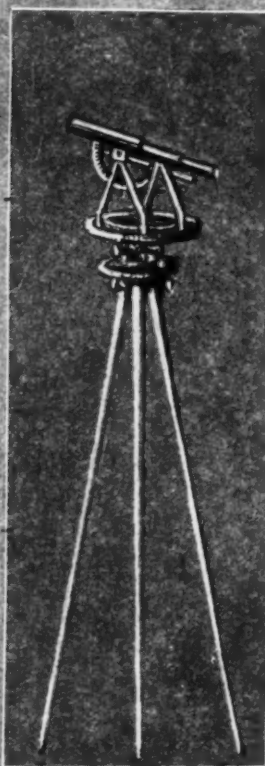
The above allowance to apply only to sand, gravel or crushed stone which is placed upon the work at the road



## HIGHWAY BUILDERS



**George E. Johnson**, Secretary of the Nebraska State Highway Commission, is a Nebraskan by birth. He gained his engineering experience in Arkansas, Missouri, Kansas and Nebraska, constructing sewers and electric light and water plants in a large number of towns in the two latter states. In 1915 he became State Engineer of Nebraska. He organized the Nebraska Engineering Society in 1914.



**J. E. Maloney**, Chief Engineer of Colorado, was born in Brooklyn. Completed engineering course at Cooper Institute of New York City. Engaged in survey and construction work on piers, municipal and railroad work in New Jersey and Indiana, on the Chicago drainage canal in Illinois and on surveys for the Nicaragua Canal. In charge of construction of Denver's waterworks system. Appointed Chief Engineer in 1918.



**D. P. Olson**, Director of Highways of Idaho, was born in Iowa. He completed his engineering course in the Civil Engineering Department of the Iowa State College at Ames in 1912. From date of graduation to June, 1916, engaged in private practice at Idaho Falls. Entered the army in 1916 and served until May, 1919, as Lieutenant-Colonel of Engineers.



**N. D. Darlington**, Chairman of the California Highway Commission, is a native of Pennsylvania and received his education as well as his technical engineering at Lafayette College. Going West in 1894, he took up practical work along railway and hydraulic lines. He served as a member of the Board of Public Utilities and was appointed to the California Highway Commission in 1911. He was appointed to his present position May 10, 1919.

in such a manner that there will be no waste of material, and in accordance with directions and to the satisfaction of the Division Engineer, and upon written permission from the First Deputy in connection with construction contracts, or the Second Deputy in connection with repair contracts. Any material of the above character if delivered without such permission, shall be rejected by the engineer in charge.

(1) All of the prices and percentages hereinbefore named are maximum. Lesser prices or percentages should be used by the Division Engineer where conditions warrant.

(m) No estimates for materials delivered will be made for materials deposited on private lands, unless a waiver in due form as prescribed by this Department be executed by the owner of the premises.

(n) A sign reading "Property of the State of New York" must be placed upon all materials delivered upon the work but not in place during the winter months, except where stone is strung along the roadway.

(o) For metal reinforcement for concrete purposes delivered upon the work, but not in place during the winter months, allow not over 60 per cent. of the item price for material in place, if the item price is 5c per lb. or less; allow 50 per cent. of the item price if such item price is more than 5c and does not exceed 10c per lb.

For metal reinforcement for concrete pavement delivered upon the work but not in place during the winter months, allow as above if the item price bid is per lb.; allow not over 4c per lb. if the reinforcement is included in the bid price for the pavement; allow not over 60 per cent. of the item price bid if the price is  $1\frac{1}{4}$ c per sq. ft. or less; allow 50 per cent. of the item price bid if such item price is more than  $1\frac{1}{4}$ c and does not exceed  $2\frac{1}{4}$ c per sq. ft."

I would call your attention to the fact that the period between November 20 of one year and April 20 of the following year is considered as "winter months" and the above payments apply only to materials delivered upon the work, but not in place between said dates.

### NORTH CAROLINA

W. S. FALLIS, STATE HIGHWAY ENGINEER.

"OUR State law at present prevents our paying any advances on materials prior to the completion of the work itself. I would very much favor arrangements by which the State could safely pay for the materials on the work and complete title could be made by contractors to the State on payment of estimates on same."

### NORTH DAKOTA

W. H. ROBINSON, CHIEF ENGINEER.

"THIS STATE provides for advance payments for materials under force account work by contractors. We have discussed and favor the proposition. One consideration would of course be the satisfying of Federal legislation."

### OKLAHOMA

ROBERT C. TERRELL, STATE ENGINEER.

"IT is the policy of this office not to pay for material in advance of their incorporation in the work. The Department does not care to recommend a change in policy at this time for good and sufficient reasons."

### OREGON

HERBERT NUNN, STATE HIGHWAY ENGINEER.

"IN order to encourage storage the State Highway Commission at its last meeting authorized the State Highway Engineer to estimate material up to 75 per cent of actual cost to contractors at the storage pile and include the same in the contractor's monthly estimate.

"In view of this consideration contractors neglecting to store materials ahead and who fail to complete their contracts within the working season for this reason will not be granted extensions of time but will be subject to the full penalty provided."

### PENNSYLVANIA

W. D. UHLER, CHIEF ENGINEER, STATE HIGHWAY DEPARTMENT.

"AT the present time, due to present laws of the Commonwealth, we are unable to make payments for material delivered on the site of the work, but there is under consideration possible amendments which will permit this Department to make payments of this character."

### RHODE ISLAND

I. W. PATTERSON, CHIEF ENGINEER, STATE BOARD OF PUBLIC ROADS.

"THIS matter has not been serious with us because of our very general practice of furnishing the material to contractors. The great majority of our road contracts have involved bituminous macadam or bituminous concrete roads. Our contracts for roads of this type involve the furnishing of bitumens by the State. Contractors, however, furnish all other materials excepting pipe culverts and catch basin frames and grates. In the case of crushed stone in roads of this type, there never is delay in our work in the placing of this material upon the road, so that there has been no complaint upon the part of the contractors concerning our practice of paying for materials of this sort only after they have been placed. In other words, none of our contractors has stacked his crushed stone in advance and re-handled it.

"In the case of cement for pavements and structures we do not furnish cement, but we allow contractors estimates for cement delivered upon the site of the work previous to its use. Our law refers in no way to payment for materials previous to their use and we consider therefore that we have a right to do it."

### SOUTH DAKOTA

JOHN BERG, HIGHWAY ENGINEER.

"NO provision has been made to date in the specifications for paying contractors for material in advance of the completion of the work. However, we have done this in some cases where it seemed advisable to do so.

"No amendment would be necessary in this state to permit this procedure."

### TENNESSEE

W. P. MOORE, CHIEF ENGINEER, DEPARTMENT OF HIGHWAYS.

"WE are paying on monthly estimates 50 per cent of the cost of all non-perishable materials used on construction. These payments are made only upon receipted invoices furnished by the contractor."

### TEXAS

ROLLEN J. WINDROW, STATE HIGHWAY ENGINEER.

*The following clause in the specifications covering highway work shows the State's policy in this matter.*

"AT the earliest possible date after the first day of each month, the Engineer will make current estimate in writing of the materials in place complete and the amount of work performed during the preceding month or period and value thereof at the unit price contracted for as shown in Proposal and Contract. In addition to the above, an estimate may be made for payment of 75 per cent of the value of the reinforcing steel, structural steel, crushed stone, gravel and paving brick delivered on the work and not used at the time of such estimate. From the amount so ascertained shall be deducted 10 per cent to be retained until after the completion of the entire work to the satisfaction of the Engineer and 90 per cent. of the amount so ascertained shall be paid the Contractor."

### UTAH

IRA R. BROWNING, CHIEF ENGINEER

"THE State Road Commission of Utah will pay contractors for material stored on the job during the winter in anticipation of spring work."

### VERMONT

STODDARD B. BATES, COMMISSIONER.

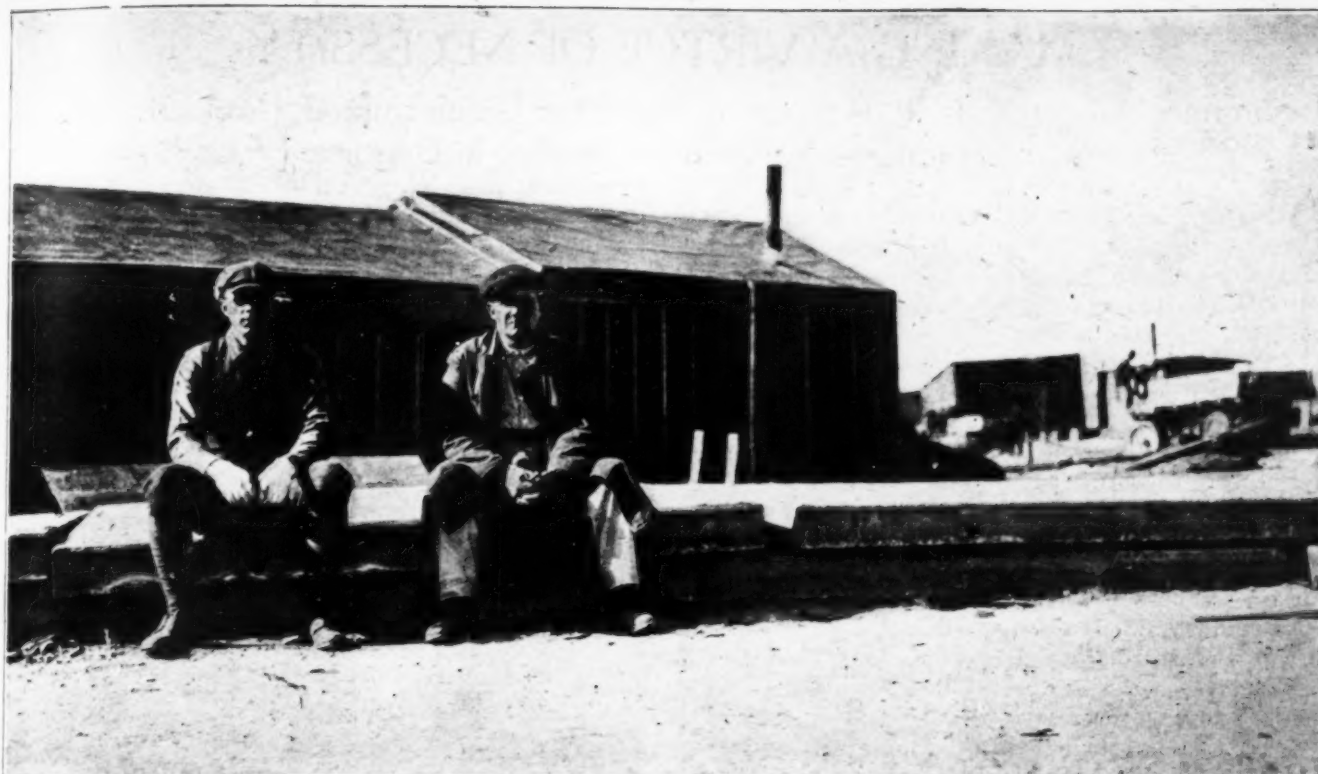
"THE contracts we have made so far (although we have no definite statute on the subject) have provided for payment at certain periods on Engineer's estimate of work done and material furnished and the Engineer has included in his estimate 'material on hand.'"

### VIRGINIA

G. P. COLEMAN, STATE HIGHWAY COMMISSIONER.

"REPLYING to your letter relative to provisions made by this State to pay contractors for materials as soon as they are delivered on the site of the work, the object being to encourage contractors to get their materials





AN UNUSUAL JOB UNDERTAKEN BY THE WYOMING HIGHWAY DEPARTMENT. PRE-CAST CONCRETE SLABS ARE BEING LAID ON THE CASPER-SALT CREEK ROAD, ALONG WHICH NO WATER IS AVAILABLE. THIS PHOTOGRAPH SHOWS SOME OF THE SLABS READY TO BE TAKEN TO THE ROAD ON MOTOR TRUCKS.

during the winter and early spring, in order to facilitate as much as possible the advancement of the work during the coming season, under these circumstances this Department has incorporated a clause in its contract which will allow the payment of 65 per cent of the cost of such materials."

### WASHINGTON

JAMES ALLEN, STATE HIGHWAY COMMISSIONER

"NO payment is made in this state to contractors for material delivered on the job in advance of the completion of the work, although such payment is not impossible."

### WEST VIRGINIA

C. P. FORTNEY, CHAIRMAN, STATE ROAD COMMISSION.

"IN West Virginia all highway construction is directly under the control of the various county courts. Some of these counties have been making payments on material in advance of the completion of the work and some have not. About six out of the fifty-five make advance payments."

### WISCONSIN

A. R. HIRST, STATE HIGHWAY ENGINEER.

"PRACTICALLY all the contracts awarded in this state during the last season have had provision for the payment of the contractor, up to 85 per cent. of materials delivered on the work, excepting cement, which we confine to 75 per cent. owing to its more perishable nature."

### WYOMING

D. S. McCALMAN, STATE HIGHWAY SUPERINTENDENT.

"WE have incorporated in our standard form of contract and are putting in special notice in connection with all lettings, a paragraph reading: 'The contractor will be allowed on monthly estimates payment for iron, steel, cement and piling furnished, provided the same are stored so as to prevent damage from exposure from the elements or from any other cause and provided further that contractor furnishes a receipted invoice for such material. Payments shall be based upon prices until determined by the engineer.'

"We are of the opinion that this clause has been decidedly helpful the last year to a great many of our contractors, and has given us competition in the matter of bids that we would not have received without."

### DISTRICT OF COLUMBIA

MAJOR F. S. BESSON, ASSISTANT TO ENGINEER COMMISSIONER.

"AS regards our contracts for highway construction and sewer contracts, there is no necessity for a provision such as suggested in your letter. In these cases materials are used as received, and therefore, the cost of same is included in vouchers for partial payment for work done."

"In contracts for building construction for the District Government, the following provision is made:

"In each measurement sheet in addition to the amount allowed for work and material in the building, 60 per cent of the value of the materials as determined by the inspector or engineer which have been delivered on the site and approved for use in the building and which becomes the property of the District of Columbia will be included in the partial payments."

### Highway Officials to Meet in Washington

THE annual meeting of the American Association of State Highway Officials which is composed of most of the state highway engineers in the country and other members of their organizations will be held in Washington, D. C., on December 13, 14, 15 and 16.

By getting together once a year the state highway engineers have an opportunity to exchange experiences and views and by so doing advance the interests of road building in the United States. Paul D. Sargent of Maine is president of the Association.



## MAKING A VIRTUE OF NECESSITY

Economical Concrete Plant is Result of Need for Uninterrupted Production While Adding to Automobile Factory in Detroit

**P**RODUCTION and construction don't always get along together. The building of many new factory structures has been put off because there seemed to be no way of keeping production going uninterruptedly during the progress of the construction work.

That was the problem which confronted the Hupp Motor Car Corporation when it decided to enlarge its plant at Detroit. Production was going on full blast in a number of the one-story buildings which occupied the space in which the new buildings were to go.

Everett Winters, general builder, of Detroit, obtained the contract for the new buildings and the solution of the problem was up to him. Not only did he solve it, but the cramped quarters in which he had to operate literally forced him to design a layout for his concrete mixing and distributing plant which has proved so efficient and such a money saver that he intends to use similar setups on future jobs.

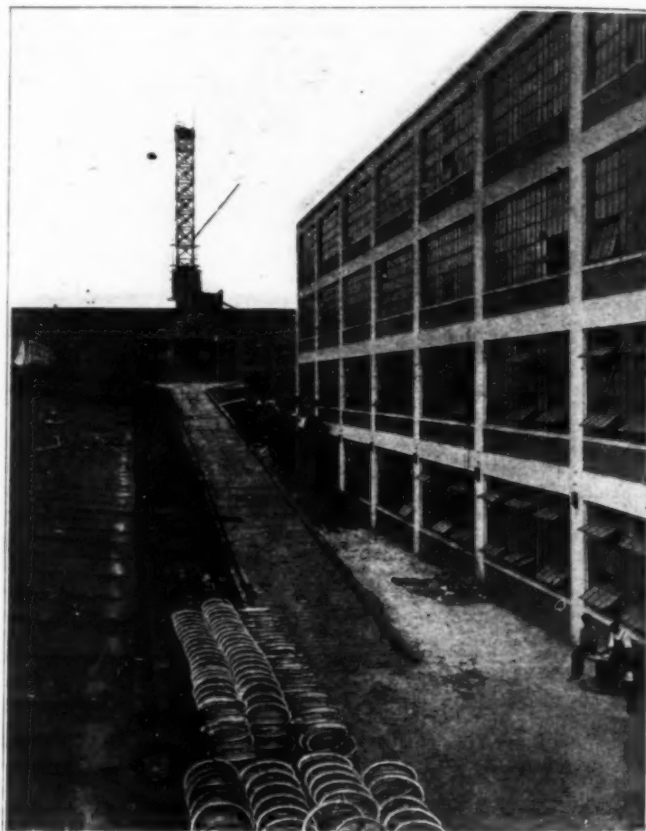
The job had to be divided into three operations. Building "B" and two-thirds of Building "C," each 4 stories high, containing 190,000 sq. ft. of floor space, constituted the first operation. The second operation consists of Building "C" extension and all of the main Building "A," each 4 stories high, containing 195,000 sq. ft. of floor space, with an underground reservoir 16 ft. deep, 40 ft. wide and 250 ft. long, an export distributing and shipping building containing 50,000 sq. ft. of floor

space, loading decks and a reinforced concrete, two-car wide tunnel, 15 ft. deep by 22 ft. wide and 275 ft. long, underneath the Michigan Central Railroad, connecting to a new roller test building, 40 ft. wide by 389 ft. long.

The third operation will consist of buildings "D" and "E," each four stories high, with 240,000 sq. ft. of



THE CONCRETE MIXING AND DISTRIBUTION PLANT. THE UPPER HALF OF THE INCLINE MAY BE SEEN IN THE CENTER OF THE PHOTOGRAPH.



THE INCLINED RUNWAY WHICH SOLVED THE PROBLEM OF GETTING MATERIALS TO THE MIXER. THE SAND AND GRAVEL WERE TAKEN UP THIS RUNWAY IN TRUCKS AND DUMPED INTO BINS OVER THE MIXER.

floor space. The photograph at the bottom of the opposite page shows how the new buildings are arranged.

Building "B" and two-thirds of Building "C" had to be built first in order to provide room for the final assembly of cars, because when construction began the final assembly was in the low buildings on the site of Building "A." After Buildings "B" and "C" were erected and the final assembly department moved into the new structures, work was started on the wrecking of the old buildings and excavation and concrete for foundation work on Building "A" and the balance of Building "C" was started.

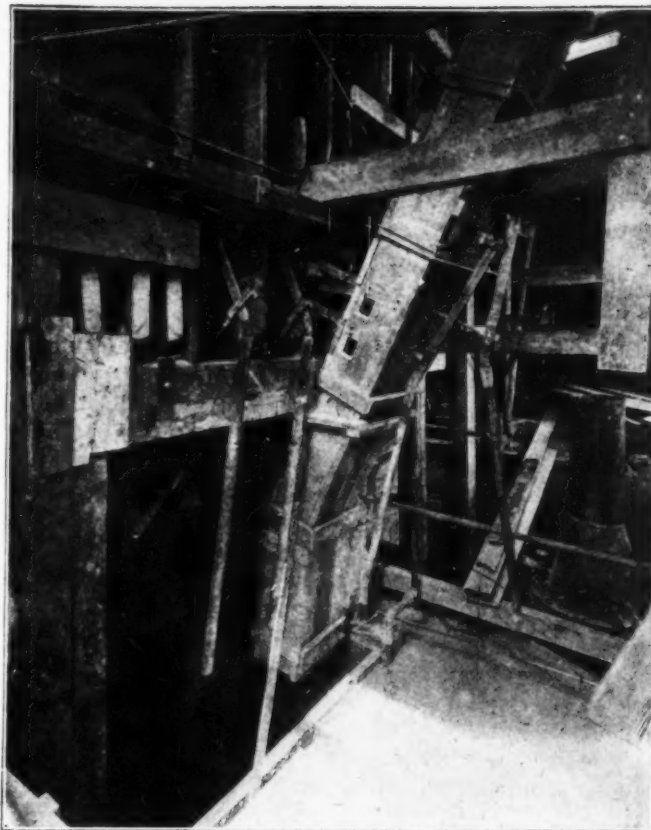
Then the problem of enabling the Hupp Motor Car Corporation to continue without interruption was solved by building a 400-ft. tunnel 10 ft. high by 16 ft. wide, out of frame, across Building "A" and through the center of Building "C" to the first unit of Building "C." This was used for the conveying of chassis to the ovens of the new buildings from the old plant. There was also

a large enclosed conveyor brought across Building "A" at the third floor level and down into the new building, to convey the bodies. This tunnel and conveyor were so arranged that production was carried on while the additions to Building "C" and Building "A" were being put up around them.

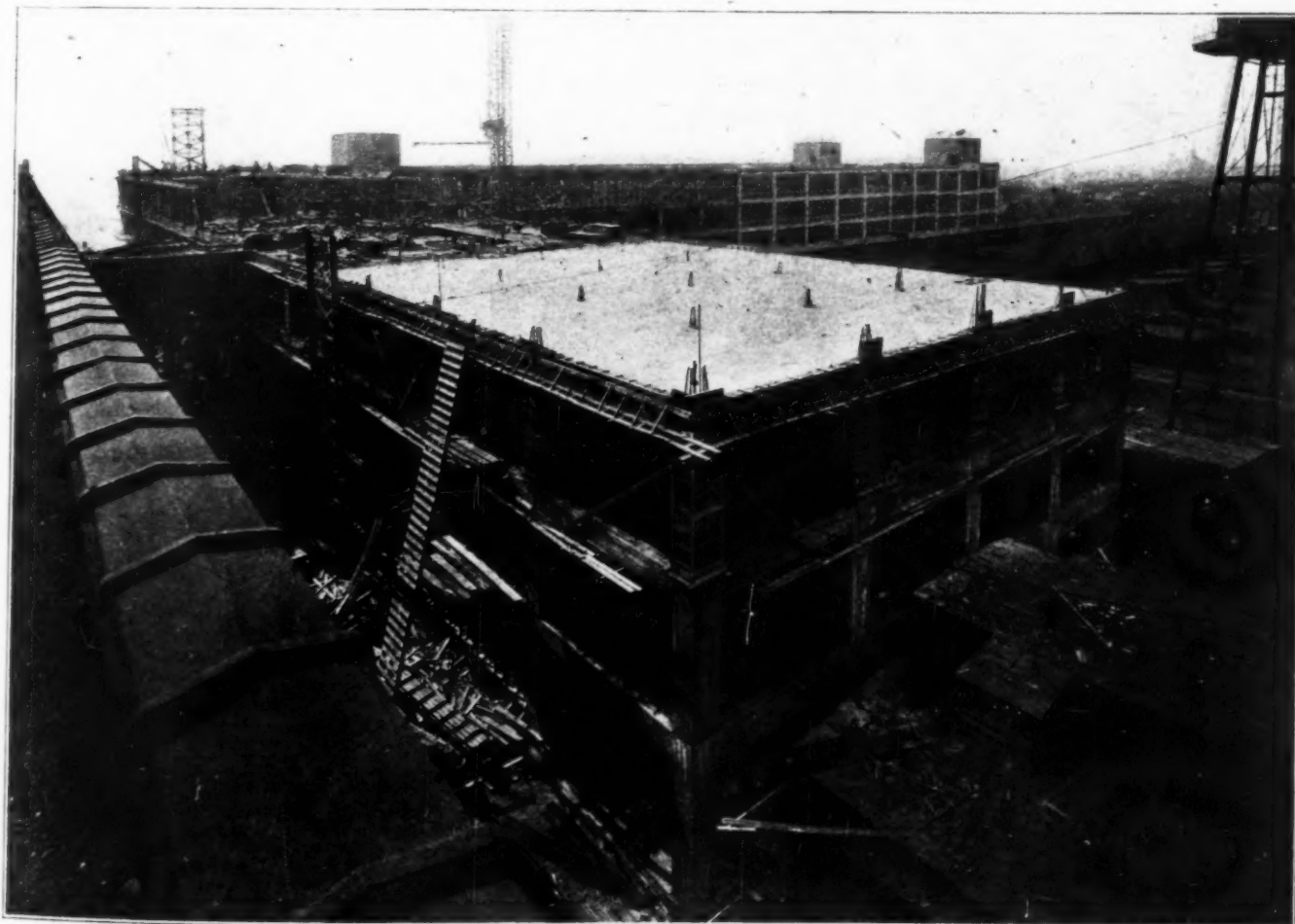
There was no room for the mixing plant in the street beside the building, because of the street car tracks, and although the court between the old buildings and the new looked like a favorable place, it was barred out by the fact that the owners insisted that this court be kept clear.

For a short time during the construction of Buildings "B" and "C" a small plant was put up in the court, but it soon had to be removed. The ultimate solution was the installation of the mixing plant and tower at the head of the court between Buildings "C" and "D." Storage space for gravel and cement was provided by building bins over the mixer and gaining access to them by constructing an inclined runway about 250 ft. long, and rising on a grade of 8 per cent to a level platform on top of the gravel bin. Sand and gravel were delivered in motor trucks which had to climb the incline, dump their loads and go down again.

The sand and gravel are dumped on a grating over the bins, which have a capacity of 275 to 300 cu. yds. The cement is hauled and dumped directly back of the sand and gravel into a separate bin, and conveyed by a chute directly to the mixer. A big curtain across the front of the shed in which the cement is handled affords weather



THE DISCHARGE SPOUTS WITH THEIR COMPACT  
ARRANGEMENT OF LEVERS



THIS PHOTOGRAPH TAKEN FROM ONE OF THE OLDER FACTORY BUILDINGS SHOWS THE GENERAL LAYOUT OF THE JOB. BUILDING A, STILL UNDER CONSTRUCTION, IS IN THE FOREGROUND; BUILDINGS B AND C ARE BACK OF IT. BUILDINGS C AND D ARE TO RUN PARALLEL TO B AND C, REPLACING THE LOW STRUCTURES SEEN IN THE PHOTOGRAPH.



protection. About three truck loads of cement can be stored in the bin with additional room in the shed to pile up 3 carloads of cement for reserve.

All this storage space renders the mixing plant immune to idle men as a result of delays in deliveries. Enough material for a day's run can be stored, if necessary. It is also compact, and only 4 men are employed on the deck where the materials are dumped. They clear the deck of gravel which falls outside the limits of the grating and keep the cement chute full, and in their off moments clean and pile sacks for return shipment.

From the bins to the mixer the materials are controlled and released by a compact and simple system of levers. They are shown in one of the photographs. Only two men are needed to operate them, and they are so arranged that the exact quantities for a batch are discharged into the mixer. Three more men, one to run the mixer, one on the hoist and one to fire the boiler, are employed. The engineer is situated above the mixer and in clear view of the tower, where he can see exactly what is going on.

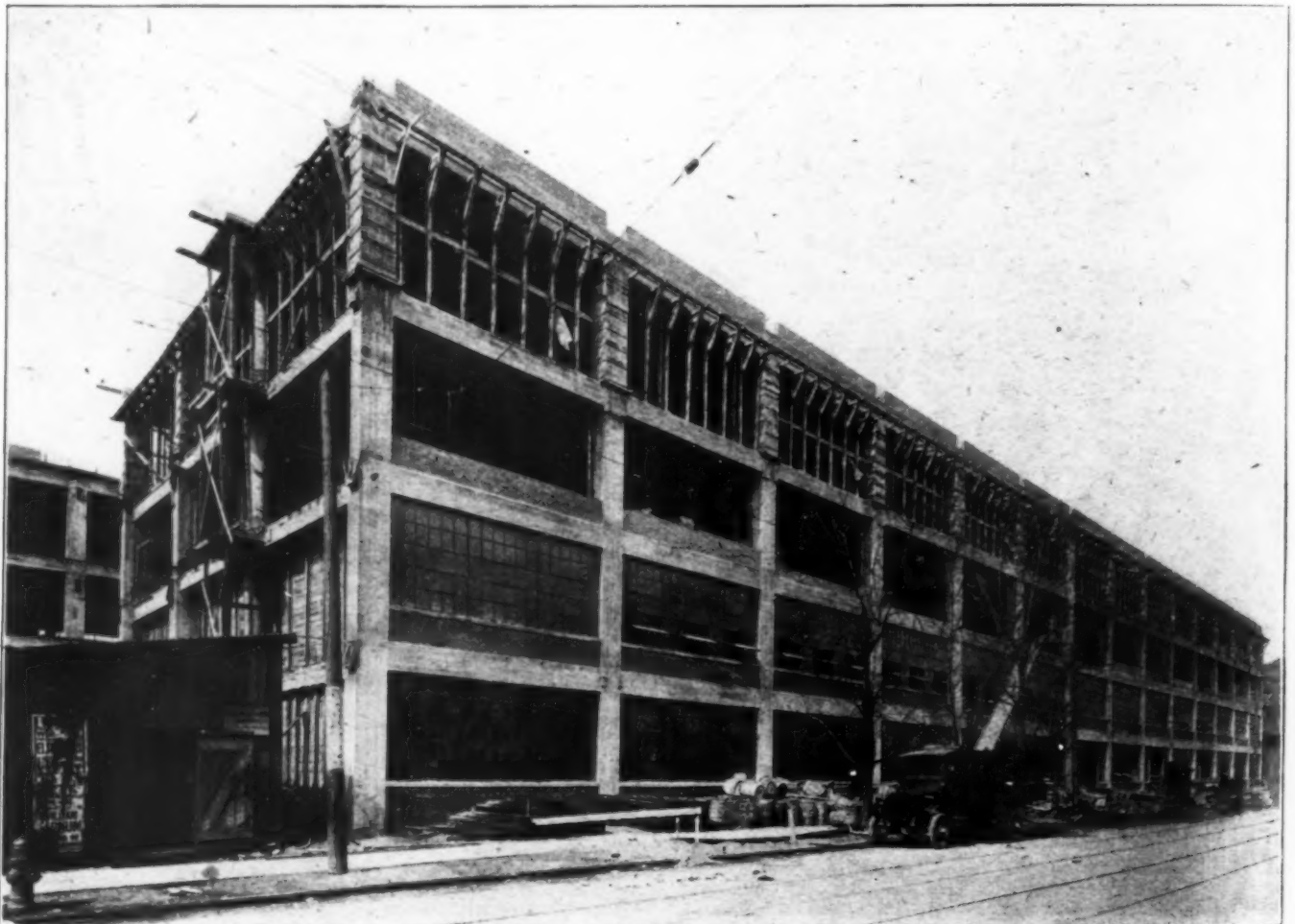
With this outfit Mr. Winters has made some excellent records. The bucket has averaged one round trip in 1 min. and 10 sec. over a 10-hour run. Concrete has been poured at the rate of 400 yd. a day. With the tower and concrete plant in its present position and by employing two spouting units on the tower, it is possible by very little moving of the chutes, to pour concrete on 4 different floors. A combination of spouting and wheeling with

concrete carts is used on some parts of the work where it is impractical to use chutes, due to the amount of rigging.

An example of the speed with which Mr. Winters works may be seen in the record made on Buildings "B" and "C." The foundations were begun December 4, 1919, the first concrete poured on January 24, 1920, and the roof completed March 25, 1920. Wrecking was started June 4, 1920, for the second operation and was completed in one month. All foundations, basement and tunnels and ground floor, with all underground systems, were completed by August 15. The first pour of concrete was made above the ground floor September 8 and the roof was completed October 26. The total concrete in the first and second operations is 30,000 cu. yd.

Daily unit costs are kept on all work. A maximum average of men in each capacity, limited to a certain schedule, has assured the owners of satisfactory costs and buildings completed on time. The work was divided into five sections with three sections under construction at all times, with a daily schedule worked out each week for carpenters, steel men and concrete, to complete a floor of concrete every 12 working days on each operation, after leaving the foundations and ground floor. An average of 300 men and a maximum of 400 men were employed.

Mr. Winters has made this work his major operation, and has given it his personal supervision.



BUILDING B NEARING COMPLETION. IT IS SO CLOSE TO THE STREET AND CAR TRACKS THAT THERE WAS NO ROOM FOR THE MIXING PLANT.



## ARE YOU MAKING MONEY?

If So You Will Have to Pay An Income Tax and Now Is the Time to Set Your House in Order

By JAMES J. REDDING

WHEN he prepares to close his books at the end of the year, one thing which the contractor must keep in mind is the income tax. Probably he would prefer to forget it until the time came for making his return in March but it must not be forgotten that December 31st is the date set by the Government for the close of the period for which the tax is to be collected. The businesslike contractor cannot afford to wait until March before beginning to think about his income tax. Therefore the time to think about the income tax is now while the tax entries are being made in your books so that when the end of the year comes you will have a clear, understandable record of your business activities, and later on, with the aid of that record, will be able to prepare your income tax return with a minimum of difficulty.

One thing that the contractor has to determine one way or the other is whether he will prepare his return on a basis of completed or uncompleted contracts. The income tax law was designed to cover the activities of the average business and special regulations were necessary to provide for the contracting business. The contractor gets his choice. For example, if he has a contract which is only half finished on December 31st, he either may make his return including the expenditures, income, etc., of the uncompleted contract up to December 31st, or he may ignore it entirely and carry it over into the next year, making his return for the entire contract in the year in which it is completed. It will be seen at once that this gives the contractor considerable latitude. Ultimately he pays the tax, of course. But he may decide for himself *when* he will pay it. This matter is covered in Article 36 of Regulations No. 45, which says:

"Persons engaged in contracting operations who have uncompleted contracts, in some cases perhaps running for periods of several years, will be allowed to prepare their returns so that the gross income will be arrived at on the basis of completed work; that is, on the jobs which have been finally completed, and any and all moneys received in payment will be returned as income for the year in which the work was completed. If the gross income is arrived at by this method, the deduction from gross income should be limited to the expenditures made on account of such completed contracts. Or the percentage of profit from the contract may be estimated on the basis of percentage of completion, in which case the income to be returned each year during the performance of the contract will be computed upon the basis of the expenses incurred on such contract during the year; that is to say, if one-half of the estimated expenses necessary to the full performance of the contract are incurred during one year, one-half of the gross contract price should be returned as income for that year. Upon the completion of a contract, if it is found that as a result of such estimate or apportionment of the income of any year or years has been overstated or understated, the taxpayer should file amended returns for such year or years."

Stripped of its legal phrasing, this section means what I have said above—that the contractor may decide for himself whether to carry over a contract and make no return on it until it is completed, or to estimate the quantity of work completed, expenditures, etc., up to December 31st and include them in the return.

It will be noted that the last sentence of Article 36 quoted above reads:

"Upon the completion of the contract, if it is found that as a result of such estimate or apportionment, the income of any year or years has been overstated or understated, the taxpayer should file amended returns for such year or years."

This sentence was added to the article in 1918 as a result of the recognition by the Government that proper provision had not been made for uncompleted contracts included in the returns. It is now possible to file an amended return as soon as the job is completed if it is found that the profit or loss as previously filed was figured erroneously.

The above probably will be the law on which returns for 1920 will be computed as it is unlikely that Congress will make any changes at the present session but will wait until the session beginning in March, 1921. By that time the new administration will be in office and undoubtedly will make changes in the tax laws.

In my opinion it is better to prepare the return on the basis of uncompleted contracts whenever the contractor has an efficient general and cost accounting system capable of reflecting the true costs as they relate to the progress of the work. By so doing the contractor gets a better balanced return. His overhead and other expenditures are distributed correctly and properly charged to his different jobs.

This means, among other things, that he will not show a big profit one year on which his tax is paid, and possibly a loss the next for which the Government will make him no refund. Remember the Government taxes your profits but doesn't worry about your losses. For example, if you pay tax on \$20,000 profits one year and carry over a contract which is completed the next year at a loss of \$20,000, you won't get back any of the previous year's taxes.

This matter of overhead is important. In compiling the job costs, particular care should be taken to see that the proper amount of overhead and all charges are included. I have in mind a return prepared on the basis of completed contracts where the contractor did not keep a job cost record and in determining the expenditures pro-rated too much overhead to his uncompleted jobs, and as a consequence showed an inflated profit on the completed contracts. This in turn resulted in the payment of a greatly increased tax which would have been avoided if he had charged the proper proportion of overhead to his completed job.

Another pitfall which I have encountered in checking over the records of contractors is the tendency not to make the proper distinction between maintenance and capital expenditures.

Practically all the invoices for small tools and equipment, such as dies, hack-saw blades, lanterns, picks, axes, handles for same, oil and grease cans, salamanders and hoes were charged to a capital account instead of being charged as an expense to the particular job on which

they were used. Of course, in a number of cases there will always be a salvage value, but where the job runs for some time such items will be consumed on the job and are rightly chargeable as an expense in carrying on the work. Thus, the contractor in preparing his return omitted plant expense of approximately \$3,000, which therefore was indirectly included in his profit on which he paid an income tax. This same contractor in compiling his expenditures on his uncompleted contracts, included only such items as were charged against the different jobs on the books, but due to his method of handling of purchases and accounting in the purchasing department, he overlooked outstanding obligations in the way of amounts retained on sub-contracts and invoices for material received. Consequently these were included in the estimate of the work completed inasmuch as the material already had been used. Another case of inflated profit and increased tax.

In reviewing another return it was noted that under the contractor's system of accounting and determining the profit and loss on each job, he was showing a profit on his own equipment transferred from one job to another. This was caused by the fact that no perpetual record of equipment on the job was kept and at the conclusion of the job a credit was given for all equipment removed and the general equipment account charged. Too big a tax paid again.

But just because the government permits you to carry along uncompleted contracts do not carry them along too far in that state. Do not lose sight of the fact that the longer a job is delayed the greater the overhead charge which must be borne by the job and before long

the overhead will eat up the profits. When a report showing the profit and loss on jobs was recently compiled for a contractor he was surprised to learn that one-half of the jobs showed a loss due to overhead charge on account of the jobs being carried along uncompleted for a period of twelve to eighteen months when, as a matter of fact, they should have been completed in six months. While the jobs were being delayed, the labor and material prices were mounting larger and higher and were reflected in the result.

There is another important item to take into consideration when preparing your return and compiling your job costs, and that is, depreciation of plant equipment. There are several methods of allocating the equipment charge to a job, but the more accurate way is probably to make a rental charge on the basis of the equipment sent to each job and the time it is in use on that job. This is more important in the case of a contractor who does all forms of contracting, including highway and railroad construction, where more equipment is needed than for office, hotel and factory building.

It is conceded that the life of contracting equipment is much less than equipment used in other branches of industry due to the fact that it is transferred from job to job and that there is always more or less damage done to it. It also receives rougher treatment than other equipment. There is no set rate of depreciation as the percentage varies all the way from 10 per cent to 25 per cent per year and in some cases I have charged off as high as 33 1-3 per cent. This was in Central America, where several cities, wharves and railroads were being built. The average rainfall is 133 inches but during

## EQUIPMENT RECORD

NO. \_\_\_\_\_

Article CONCRETE MIXER  
Description GASOLINE SELF LOADER  
Maker SMITH CO.  
Purchased from CONTRACTORS SUPPLY CO.  
Date of purchase MAY 10, 1920  
Condition NEW  
Weight 3000 Capacity 1 BAG

Our No. 2 Maker's No. 1684 Type B  
Invoice No. 2347  
Cost Price \$1800.00  
Estimated life 4 YEARS  
Rate depreciation 2 1/2 % MONTHLY  
Rental \$60.00 PER MONTH

MONTH	DEPRECIATION	MONTH	DEPRECIATION	MONTH	DEPRECIATION	MONTH	DEPRECIATION	INVENTORY VALUE
1920								
MAY	12 50							1920 1500 00
JUNE	37 50							
JULY	37 50							
AUG	37 50							

DATE	EXPENSE			COST.	DATE	RENTAL INCOME		EARNINGS
	DESCRIPTION	CONTRACT	INV NO.			RECEIVED FROM	INVOICE NO.	
1920					1920			
MAY	BELT		2468	6.00	JUNE	CITY	827	150 00
JUNE	LUBRICATOR		4321	8.00	JULY	JOHN DOE	915	85 00

A CONVENIENT CARD FOR KEEPING TRACK OF DEPRECIATION OF EQUIPMENT. THE REVERSE OF THE CARD SHOWS THE EXPENSES OF REPAIR, ETC., AND THE EARNINGS OF THE MACHINE.



Richards Audit Co., Chicago, Form No. C 105

## CHICAGO CONSTRUCTION CO.

GENERAL CONTRACTORS  
CHICAGO, ILLINOIS

## EMPLOYEE'S HISTORY CARD

Job or Contract #420 TIVOLI HOTEL

Location CHICAGO

Name John Smith No. 120 Age 45 Nationality American  
 Present Address 4279 N. Penna. Ave Married Yes Children 3  
 Born at Scranton Pa. Father's birthplace Same  
 Position Carpenter Rate 1.00 per hr. Hired 2/15/20 Started 2/16/20 Left 12/1/20  
 In case of accident, notify Mrs. John Smith 4279 N. Penna. Ave  
 Transportation No. Were you ever in the employ of this company before?

## RECORD OF INCREASE IN PAY

DATE	DATE EFFECTIVE	FROM	TO	AUTHORIZED BY	DATE	DATE EFFECTIVE	FROM	TO	AUTHORIZED BY
4/30/20	5/1/20	1.00	1.25	H.H.S.					

If a new employee, card is to be filled out and forwarded to main office before name is put on payroll. Card is not required for employees transferred from one job to another.

John Smith  
(Employee's Signature)

Paul Jones  
Superintendent.

THIS EMPLOYEE'S PERPETUAL RECORD CARD ENABLES THE CONTRACTOR TO TELL JUST HOW MUCH HE PAYS HIS EMPLOYEES. ALL INCREASES ARE NOTED AND ON THE BACK OF THE CARD THE TOTAL AMOUNT PAID EACH WEEK IS ENTERED.

one of the three years during which this equipment was in use there was a total precipitation of 198 inches and under such weather conditions naturally the rate of depreciation is much higher. In short, it is permissible to charge off a rate of depreciation equal to the life of the asset and no one can tell that any better than the owner himself. He is the man on the ground. He knows what the machine cost, how long it has been used, the kind of work it has done and the condition it is in. With these facts before him he can determine approximately how much longer it will last, and so figure the rate of depreciation.

I also have found it very common among "close" corporations where the officers own a majority of the stock to pay themselves a salary which is not commensurate with the services rendered and the business transacted. I attribute this to two reasons: First, they are desirous of allowing the money to remain in the business as working capital; second, not being familiar with the salaries of officers of other contracting corporations, they do not know the earning power of their own services and desire to be within the Government's regulations which are very strict and severe.

For example: One return that I reviewed showed the estimate of work completed approximately \$3,000,000 and the salary of the president \$3,000, whereas the head of another corporation whose completed work amounted to \$250,000 received a salary of \$10,000 per annum.

Fully 50 per cent of the returns reviewed last year were in error in making their deductions from invested capital for income tax paid. Instead of figuring the deductions from the dates when due and payable, that is, March 15th, June 15th, Sept. 15th, and Dec. 15th,

the total of tax was deducted as of March 15th. Every deduction from invested capital means more income tax to be paid during the following year.

No doubt a large number of contractors will recall the trouble they experienced in compiling the list of employees earning \$1,000 and more per annum to be forwarded to the government not later than March 15th each year to comply with Section 256 of the law. This confusion and expense can be avoided at the end of the year by having an employees' record card and by keeping a perpetual record of the amount earned by each employee.

Just because your returns for the last two or three years "got by" all right, don't be too sure that you know all about the game. Practically all of the revised returns prepared and claims for refund filed are based upon the improper computation of invested capital and while you may have filed your returns for 1918 and 1919 and not heard from them, still it is possible that there are some errors on them and that they have not as yet been audited by the Government.

Like all Government accounting, the preparation of the Income Tax Return requires the dotting of the "i" and the crossing of the "t" and even drastic changes in the law will not eliminate this "Red Tape." While with the Government I learned that each requirement has its value and purpose and the "Red Tape" is nothing more than a series of formalities which cannot be waived.

There is no business so complex as the contracting business and too much care cannot be exercised in preparing the Income Tax Return on the basis of uncompleted contracts, to see that all costs are included when deducting them from the estimate of work completed to determine the profit or loss for the year.

## "WHAT'S IN A NAME?"

### Peter Kiewit's Sons of Omaha Supply the Answer

THE old query, "What's in a name?" is answered rather decisively by the name of one of Omaha's most successful and progressive contracting firms. The words, "Peter Kiewit's Sons," may be seen on structures going up in various sections of Nebraska's biggest city, and the name tells the whole story.

Three sons of Peter Kiewit are carrying on the business that their father began 36 years ago. Under their management it has grown bigger than Peter Kiewit ever dreamed it would, but they prefer to let the reputation he established be their trademark. So Peter Kiewit's Sons has been the firm name since his death six years ago, and Peter Kiewit's Sons it will remain no matter how big it may grow, or how great the individual reputation of its members may become.

When he came to Omaha in a prairie schooner from Keokuk, Iowa, in the days before the Nebraska metropolis became a big city, Peter Kiewit got a job laying brick for a local contractor. There was plenty of building in those days, and about 5 years after his arrival, he branched out in business for himself. One of the first structures he put up, a 3-story brick building, is still standing on the northeast



THE QUARRY OWNED BY THE KIEWIT BROTHERS SHOWING THE NEW METHOD OF TUNNELING

corner of 14th and Davenport Streets.

In addition to putting up buildings, Peter Kiewit raised four boys, and he raised three of them in the contracting business. Ralph W. Kiewit, the oldest, learned to be a carpenter; George A. Kiewit became a bricklayer, and the third son, Peter Kiewit, Jr., also served an apprenticeship in the best contractors' school in

the world—hard work right on the job, and plenty of it.

The practical side wasn't the only side of their training, however. All three began their work during their school vacations. Ralph and George each spent a year at Iowa State College, but had to leave because their father's illness made them necessary in the conduct of the business. Peter went East to Dartmouth for a year, but the war cut short his collegiate career. The sons took hold in 1913, Ralph and George being taken into partnership.

In the last few years the business has developed remarkably, and one job well done has led to another, until the firm name has become a familiar sight on new buildings in Omaha. In the year just ending Peter Kiewit's Sons have done approximately \$500,000 worth of construction work. One big job that is just about completed is a 10-story brick and steel building for the Omaha Cold Storage Company. Other work done in the last few years includes several apartment houses, a hotel, a warehouse for the Goodyear Tire & Rubber Company, a 6-story reinforced concrete syrup factory, a school, one of the buildings for the University of Omaha, and 3 churches. Another



RALPH W. KIEWIT



GEORGE A. KIEWIT





PETER KIEWIT, JR.

the supply of stone is limited. The capacity of this plant is 5 cars of crushed stone per day, of which 20 per cent is used in their own business. There is a ready market for the remainder.

An example of the progressiveness of the Kiewit organization is the recent adoption of modern methods of getting out the stone in this quarry. Heretofore in that section of

The present firm of Peter Kiewit's Sons was incorporated in 1918. Ralph W. Kiewit is president and George A. Kiewit is vice-president. Peter Kiewit, Jr., is not yet a member of the firm, but will be before long. In 1917 the brothers engaged E. E. Gilmore—a graduate engineer of Worcester Polytechnic Institute—to meet a growing need in the business—that of a trained estimator and engineer. He has made a valuable addition to the organization and is now a substantial stockholder.



E. E. GILMORE

the country all crushed rock has been taken out by stripping off the huge overburden. In the Kiewit quarry a system of tunneling has been begun. These tunnels are 25 feet wide and are driven in the ledge, leaving 6 feet of solid rock for a roof. They are now back 60 to 70 feet, and in describing the new method of operation Ralph W. Kiewit said that the quality of the rock is much better because of the fact that no dirt or other foreign matter is mixed with it. He regards the new method as a great success. One of the photographs shows the size of the ledge and two of the tunnels.

All of the members of the organization are young men—the pictures tell you that—but they have done a great deal and have done it well in their short business life. That the Omaha Builders' Exchange has twice chosen Ralph Kiewit as its president is an indication of the esteem in which these men are held by their competitors in the construction business. Peter Kiewit's Sons can be depended upon to keep right on growing in the future.

## Successful Methods Income Tax Service

Free to Those Who Can Use It

As first announced in the November issue **SUCCESSFUL METHODS** is conducting an Income Tax Service for the benefit of its readers. This service is without charge. If you have any Income Tax problems that puzzle you, send your questions to the Income Tax Service, **SUCCESSFUL METHODS**, 140 South Dearborn Street, Chicago, Ill. Two typical questions that have been asked appear below, with the answers:

**Question:** During 1920 we bought lumber at a price 20 per cent higher than we now have to pay for it. May we price our inventory "on the cost or market basis whichever is lower" in figuring our 1920 return although in both 1918 and 1919 our inventories were priced on a cost basis?

**Answer:** A recent ruling of the Treasury Department permits a contractor to change from a cost basis in pricing his inventory to a "cost or market basis whichever is lower" providing he first writes to Washington and obtains permission from the Treasury Department.

**Question:** On a trenching machine purchased five years ago for \$5,000 that was reported on last year's tax return at a value of \$5,000 what depreciation could be taken for the year 1920?

**Answer:** You evidently have not charged off any depreciation on your machine in previous years as you should have done. In order to charge off the proper amount of depreciation it is necessary to charge off for each of the five years an amount similar to that which you intend to charge off this year. This will automatically reduce your invested capital at the beginning of the current year. In your case 15 per cent of the cost value each year would be the proper percentage to charge off as expense.



THE export business of the non-competing manufacturers whose advertising appears in this Magazine is handled by the Allied Machinery Company of America.

**ALMACOA**



## To Increase the Power of Human Hands

TO HARNESS the water power—to build highways and railways—to construct harbors—to erect buildings—to afford irrigation and drainage—to make this old world of ours a better place in which to live is a gigantic task.

Human hands—unaided—would take an eternity to produce results,—but human hands plus the economical and efficient work of labor conserving machines make the task possible and practical.

This is the function of the Allied Machinery Company of America, and it is organized to fill it. Almacoa machines to increase the power of human hands and Almacoa men to show how to do it.

**ALLIED MACHINERY COMPANY OF AMERICA**

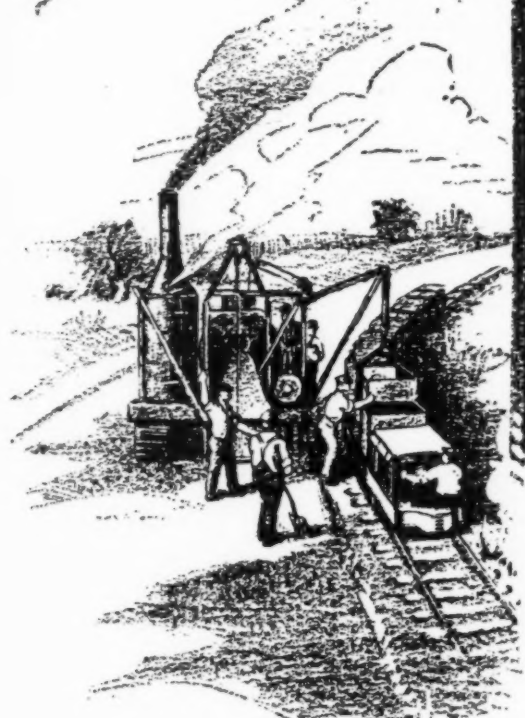
Cable Address: ALMACOA

51 Chambers Street—New York

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- |   |   |
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| <b>ARGENTINA</b> —Buenos Aires, J. A. Cordeal, Venezuela, 691. Cable Address: CORDEAL.                              | <b>FRANCE</b> —Paris, Allied Machinery Company de France, 19 Rue de Rocroy. Cable Address: ALMACOA.         |
| <b>BELGIUM</b> —Brussels, Allied Machinery Company of America, 34-36 Rue Meisens. Cable Address: ALMACOA.           | <b>INDIA</b> —Karachi, Allied Machinery Company of America, P. O. Box 4. Cable Address: ALMACOA.            |
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| <b>BRAZIL</b> —Rio de Janeiro, Oscar Taves & Co., 90-92 Rua Sao Pedro. Cable Address: ARAMPO.                       | <b>JAPAN</b> —Tokyo, Horne Company, Ltd., 6-7 Takiyama-cho, Kyobashiku. Cable Address: HORNE.               |
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| <b>ENGLAND</b> —London, Allied Machinery Company, Limited, 132 Queen Victoria St., E. C. 4. Cable Address: ALMACOA. | <b>SWITZERLAND</b> —Zurich, Allied Machinery Company of America, 16 Seidengasse. Cable Address: ALMACOA.    |





# Mr. Executive—

Wasteful extravagance exists wherever two men are doing the work which by better methods could be done by one.

Are You applying  
*Better Methods?*

NEW YORK CITY  
BOSTON  
PHILADELPHIA

RICHMOND  
MEMPHIS  
ATLANTA  
DALLAS

HOUSTON  
MILWAUKEE  
CHICAGO  
ST. LOUIS

WRITE THE NEAREST OFFICE  
INDIANAPOLIS  
MINNEAPOLIS  
DES MOINES  
PITTSBURGH

CLEVELAND  
BUFFALO  
DETROIT  
KANSAS CITY

SAN FRANCISCO  
LOS ANGELES  
PORTLAND  
SEATTLE

EXPORT-ALLIED MACHINERY CO. OF AMERICA, N.Y. CITY

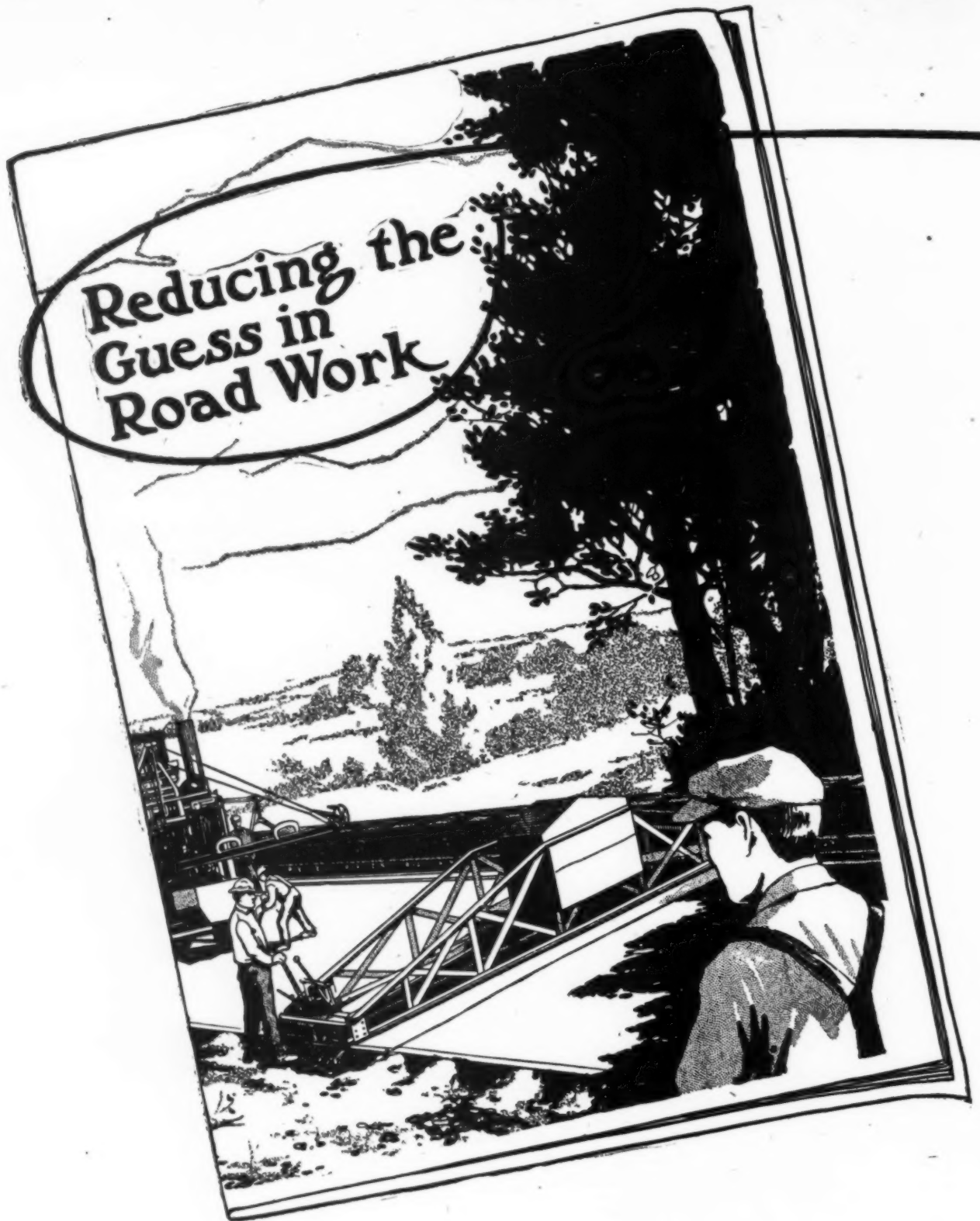


# Lakewood

## Methods and Machines



THE LAKEWOOD ENGINEERING COMPANY, CLEVELAND, U. S. A.

NEW YORK CITY  
PHILADELPHIABOSTON  
DALLASRICHMOND  
HOUSTONATLANTA  
CHICAGOMILWAUKEE  
CLEVELAND

# Lakewood

**THE LAKEWOOD ENGINEERING**



→ 48 pages of  
*Facts and Figures*

For Contractors and Engineers

*Here are the Chapter Headings:*

What Lakewood Has Done to Improve  
Road Building Methods.

Better Concrete Roads.

Speeding Up Road Building.

Reducing Costs.

The Labor Problem.

Contingencies.

Inspection.

Lakewood Road Plant.

*It Fits the Pocket. A copy is yours for the asking*

WRITE THE NEAREST OFFICE

MEMPHIS  
BUFFALO

DETROIT  
SEATTLE

ST. LOUIS  
PORTLAND

INDIANAPOLIS  
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KANSAS CITY

DES MOINES  
PITTSBURGH

SAN FRANCISCO  
LOS ANGELES

EXPORT-ALLIED MACHINERY CO. OF AMERICA, N.Y. CITY

**Methods and Machines**



**COMPANY, CLEVELAND, U. S. A.**

# If I Were a



*"Bob" Weller of Lakewood*



# Contractor—

**T**HE FIRST THING I'd do would be to get as much work as I thought I could handle next year. And I'd try **now** to get it **now**—a good bit earlier than usual.

Then I'd start lining my jobs up—**now**.

I'd contract **now** for my materials—cement and sand and stone. A few cents more for winter storage means dollars saved when work begins.

I'd figure that the railroads will be pretty badly swamped next Spring just as they were this year. For that reason, I'd get as much material on the job this winter and early next spring as I possibly could.

Then I'd line up my men. Some of these men I'd put to work looking over my plant, putting my cranes, shovels, mixers, etc., in good shape. The others I'd have where I could lay my hands on them when I wanted them.

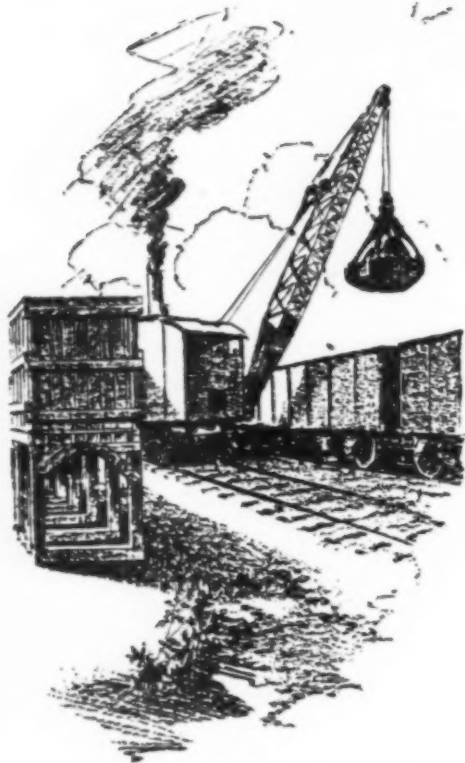
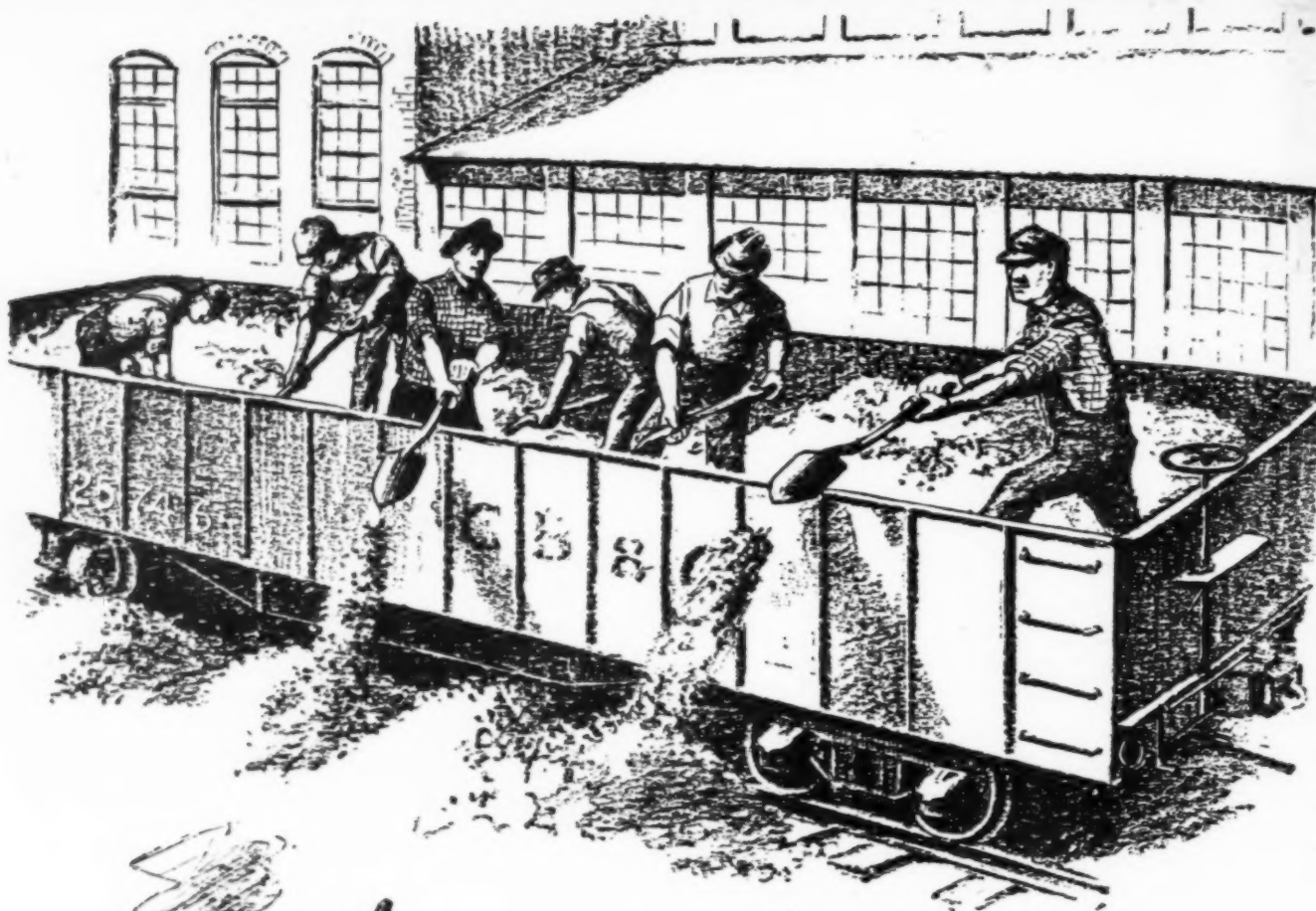
At the same time I'd figure whether I had enough equipment to do the work right. If I didn't, I'd order it **now** and specify early delivery so that I'd have it when I needed it.

Then I'd know I could hit the job hard as soon as the frost is out of the ground.

The most important thing of all is steady production in spite of "hell and high water."

That means planning ahead. It means action **now** for next year.

Let's Go—



# Mr. Executive—

Too much man-  
power is wasted  
in handling ~  
material by hand.

Better methods  
are available.

*Move it Mechanically*

NEW YORK CITY  
BOSTON  
PHILADELPHIA

RICHMOND  
MEMPHIS  
ATLANTA  
DALLAS

HOUSTON  
MILWAUKEE  
CHICAGO  
ST. LOUIS

WRITE THE NEAREST OFFICE  
INDIANAPOLIS  
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DES MOINES  
PITTSBURGH

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SAN FRANCISCO  
LOS ANGELES  
PORTLAND  
SEATTLE



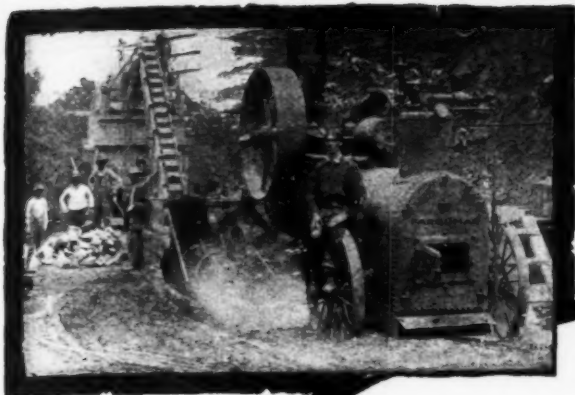
# Lakewood

EXPORT-ALLIED MACHINERY CO. OF AMERICA, N.Y. CITY

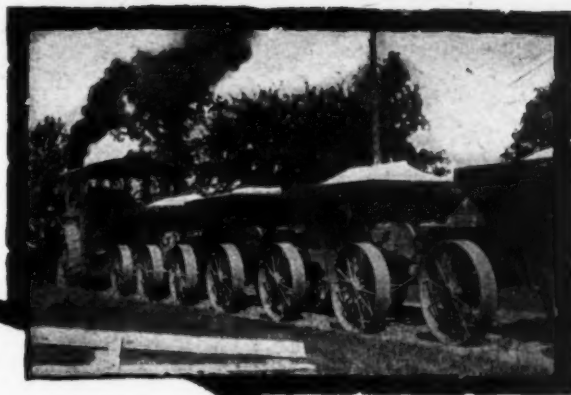
# Methods and Machines

THE LAKEWOOD ENGINEERING COMPANY, CLEVELAND, U. S. A.





Crusher operated  
by Style B Loco-  
motive Rig.



Hauling with Style  
L Double Cylinder  
Road Engine.



## Farquhar Steam Power For Contractors—

You contractors who are worrying about the high price of gasoline should investigate steam.

For plowing, hauling, trenching, rock crushing, and on hundreds of other jobs you can save money by using steam.

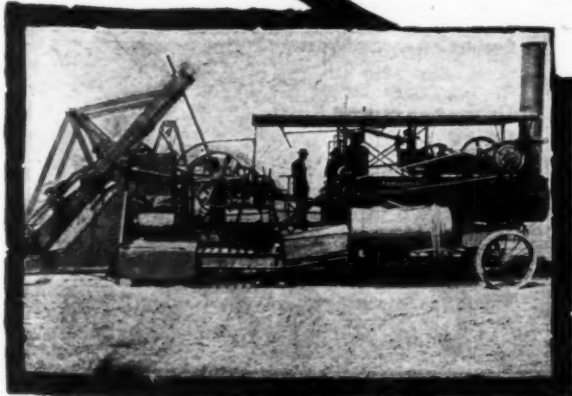
Farquhar steam engines, boilers and tractors have stood the test for nearly 60 years and many contractors will use no other power.

Are you fully aware of what steam can do on *your* jobs? If not just drop us a line, or write for catalogs.

**A. B. FARQUHAR CO., Limited**

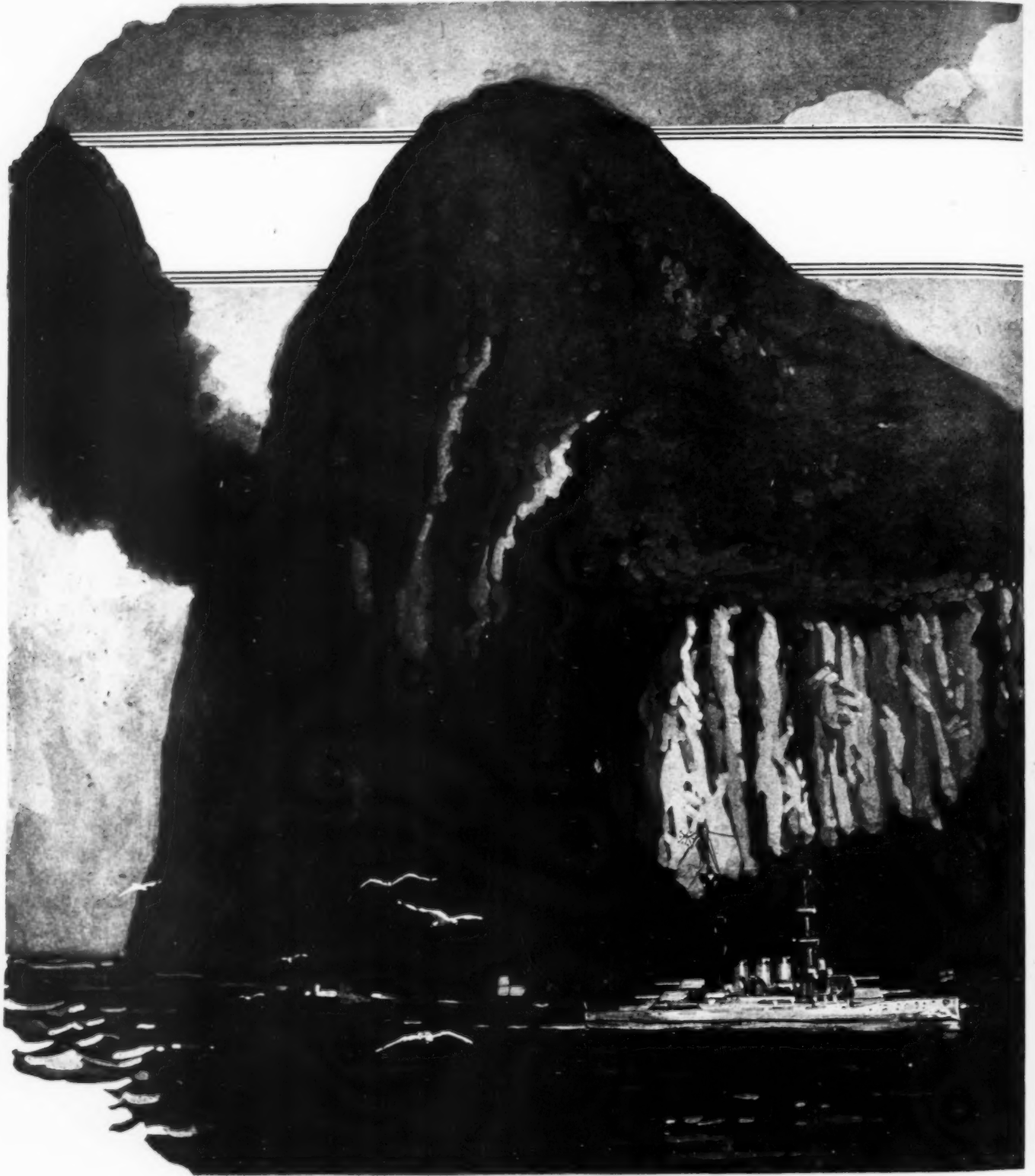
Box No. 478  
YORK, PA., U. S. A.

Locomotive Rig  
on Trench Dig-  
ging Machine.



Style K Tractor  
driving Rock  
Crushing plant.

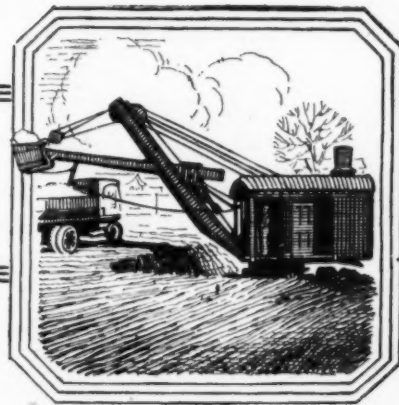




*The w*



# Strength



**D**URING more than a quarter of a century THEWS have demonstrated a "Gibraltar" strength that has come to be synonymous with their name.

Rugged construction, with simplicity of design and perfect balance, obtains that dependable, powerful, digging ability so essential in efficient shovel performance.

THE THEW SHOVEL COMPANY  
Lorain, Ohio

MAKES AUSTRIAN COMPANY OF AMERICA



# Power Shovels

# PARSONS

## *Compactness*

**T**HE maximum digging range of the machine shown is 15 feet deep and 36 inches wide. The maximum over-all width is between the Parco traction aprons, 9' 2".

The extreme length, with boom extended in road travelling position is 43' 6". The maximum over-all length of machine when digging to 15 foot depth, is approximately 35 feet.

Parsons are the narrowest and shortest trench excavators built. Reed and Wheelock are eminently Successful Contractors. A large part of their work requires excavating in alley-ways.

The decision of Reed & Wheelock to purchase their third Parsons was made in consideration of the above features, the capacity for continuous hard work with freedom from trouble they knew they could count on and—Parsons Service.

## The Parsons Company

NEWTON, IOWA, U.S.A.

NEW YORK, 145 CENTRE ST.  
EASTERN DISTRICT BRANCH

LOUISVILLE  
MILWAUKEE  
DENVER

HOUSTON  
SALT LAKE CITY  
SAN FRANCISCO

LOS ANGELES  
PORTLAND  
WINNIPEG

CHICAGO, 11 SO. LA SALLE ST.  
CENTRAL DISTRICT BRANCH

TORONTO  
OTTAWA  
MONTREAL

EXPORT DEPARTMENT  
ALLIED MACHINERY COMPANY OF AMERICA  
11 Broadway, New York City



# PARSONS

## *For Tight Places*

Reed and Wheelock's Parsons at Goodland, Kansas  
working in a narrow alley.



*We can make immediate shipment on  
some types of Parsons equipment.*

### *Digging Facts*

You want a machine that will work in alleys and other tight places just as well as in open areas. That's the kind of a machine that Parsons makes.

Remember that the digging boom in a Parsons can be lowered so that the digging angle is only 30 degrees — this means machine digging to the utmost, when turning corners — crossing laterals — going under car tracks or street crossings.

*Invest in a Parsons—  
and reduce your hand  
digging to the minimum.*

*"Pick a Parsons and  
Quit Picking"*

## The Parsons Company

NEWTON, IOWA, U.S.A.

NEW YORK, 145 CENTRE ST.  
EASTERN DISTRICT BRANCH

LOUISVILLE  
MILWAUKEE  
DENVER

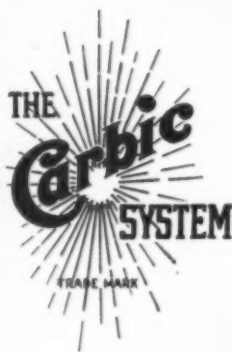
HOUSTON  
SALT LAKE CITY  
SAN FRANCISCO

LOS ANGELES  
PORTLAND  
WINNIPEG

CHICAGO, 11 SO. LA SALLE ST.  
CENTRAL DISTRICT BRANCH

TORONTO  
OTTAWA  
MONTREAL

EXPORT DEPARTMENT  
ALLIED MACHINERY COMPANY OF AMERICA  
30 Exchange Pl. New York 91 & Canada Branch New York



## -Along with Picks and Shovels

**C**ARBIC LIGHTS are now taking their place, along with picks, shovels and tampers, as *absolute necessities* on every construction job.

More and more contractors are realizing the value of portable lights—in the dark places, late in winter afternoons, and for the night shift.

Carbic Lights use Carbic Cakes—no fuss, no muss, no waste—different and more efficient.

The above photograph taken on Adams St., Chicago, in front of the post office, shows a Carbic light on the job ready to work at a minute's notice.

**Carbic Manufacturing Company**  
Duluth, Minnesota

*Sales Offices:*

NEW YORK  
141-149 Centre Street

CHICAGO  
111 W. Washington St.

BOSTON  
27 School Street

PHILADELPHIA  
18 South 7th Street

*Representatives and Stocks in all Principal Cities*





**R**ED EDGE SHOVELS provide a happy medium of factors that ultimately help the employers who have to pay the bills and don't antagonize the workmen.

**T**HE Chrome Nickel Steel Blades, necessarily heat treated, see to it that the containing end of the shovel is in full containing condition the longest possible time. The XX Second Growth Northern White Ash Handles have the strength to maintain the manipulating end of the shovel in easy and efficient manipulating shape for the extreme period.

**D**ON'T forget—please don't forget—that the best shoveling results can only be obtained by using shovels that please the workmen and at the same time have the "guts" to put up a splendid fight for the employer's interest.

**L**OOK at this picture of a scoop chained to a telegraph pole. The purchasing agent said his men wouldn't take care of good scoops, and yet it was found that the few men who were given Red Edge Scoops for test went to all kinds of trouble and expense to keep these fine tools for themselves.

**O**NE man in particular as shown in the picture had with his own money bought a heavy chain and lock and defied anybody to get his Red Edge Scoop—when he wasn't using it.

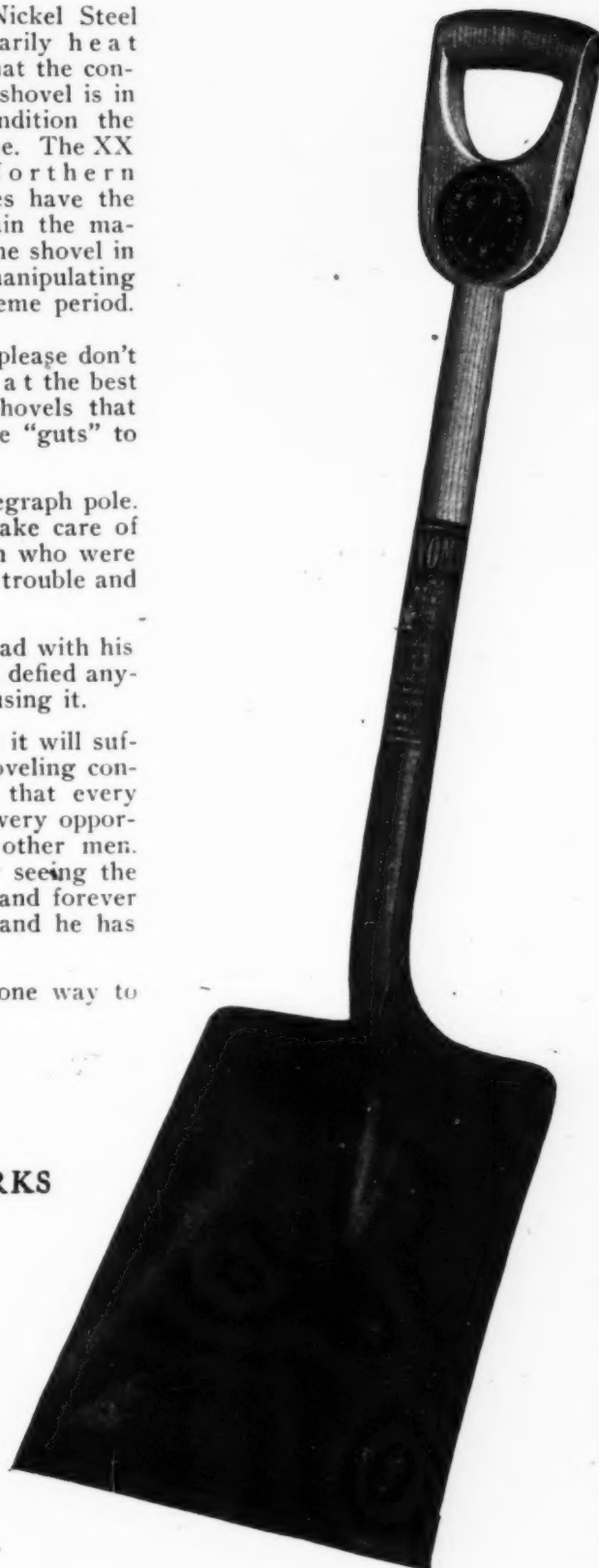
**T**HERE is a lot of story about these scoops—but it will suffice to say that they were always in better shoveling condition than the other scoops around the yard so that every morning the men with Red Edge started off with every opportunity of doing more and better work than the other men. Further, that the buyer investigated carefully after seeing the scoops fastened to the pole and he was thoroughly and forever convinced of the absolute economy of Red Edge, and he has certainly placed some nice orders.

**T**HERE are several ways of dodging but only one way to get straight ahead. That is forward.

**S**AY "I Want Red Edge."

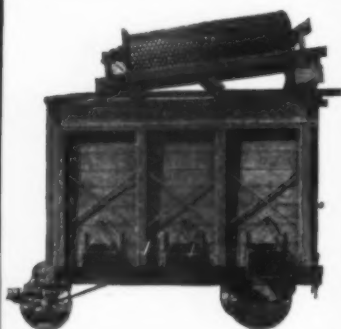
## THE WYOMING SHOVEL WORKS

WYOMING, PENNA., U. S. A.





# Roadbuilding in 1921



Western Portable Bin



Aurora Two Blow Stroke Crusher

Western Midget Grader—Weight  
1,000 Pounds

**I**MAGINE that this were April in place of December. Ten chances to one you would be wiring factories to rush shipments or placing your orders where you could get the best deliveries—regardless of the kind of machines you really wanted.

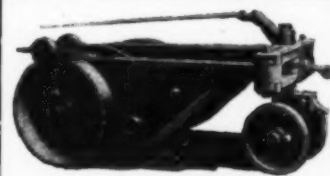
And do you realize that the machines you will want are not yet manufactured?

Waiting until April to place your orders is bound to lead to trouble, bound to see you disappointed either in the style and size of machine available, or in delivery, or in both.

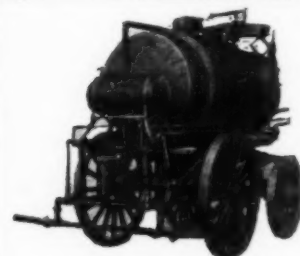
This can all be avoided if you will write us now about your needs for 1921. Let's work together on a co-operative basis. It will help us both and harm neither of us.



Austin Gyratory Crusher



Austin Steerable Scarifier

Austin Road Oiler with Heater  
Attachment

## Makers of:

MOTOR ROLLERS  
STEAM ROLLERS  
SCARIFIERS  
ROCK CRUSHERS  
STONE SCREENS  
STONE ELEVATORS  
PORTABLE BINS  
QUARRY CARS  
STONE SPREADERS

# THE AUSTIN-WESTERN CHICAGO

NEW YORK  
ALBANY  
DALLAS

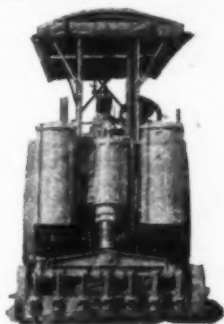
BOSTON  
ST. PAUL

PHILADELPHIA  
OKLAHOMA CITY

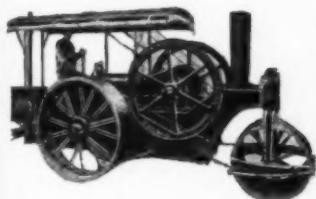
MEMPHIS  
RICHMOND  
SALT LAKE CITY



# Your Plans and Ours



Austin Attached Scarifier



Austin Motor Roller



Austin Tandem Roller

**T**HE manufacturer of road machinery has a big problem in his winter manufacturing. He must forecast the market correctly in December, else both he and you will be disappointed in April.

Materials must be purchased and the proper number of each type of machine manufactured—almost an impossibility without your co-operation.

The Austin-Western Line is a big one. There are a dozen sizes of graders, 3 styles and 7 sizes of road rollers, 2 styles and 11 sizes of rock crushers, and so on. We want to have in stock the size and style *you* will need next spring.

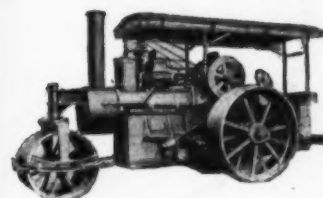
We ought to get together *now*. Write for catalog 20. It covers the entire line.



Western No. 20 Reversible Road Machine—Weight 9,000 Pounds



Austin Rip Snorter



Austin Steam Roller

## ROAD MACHINERY CO.

ILLINOIS

NASHVILLE	LOUISVILLE	LOS ANGELES	JACKSON
ATLANTA	PITTSBURGH	NEW ORLEANS	PORTLAND
COLUMBUS		SAN FRANCISCO	

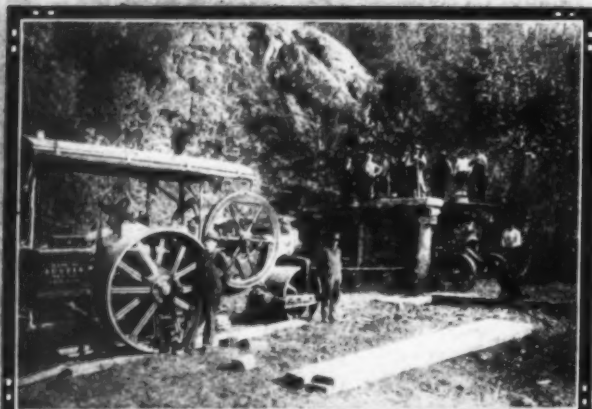
MADE IN U.S.A. BY THE ROAD MACHINERY CO. OF AMERICA

Makers of:

ROAD OILERS  
ROAD GRADERS  
ELEVATING GRADERS  
DUMP WAGONS  
STREET SPRINKLERS  
STREET SWEEPERS  
MOTOR SWEEPERS  
ROAD PLOWS  
WHEELED SCRAPERS  
DRAG SCRAPERS



# Plenty of Power for



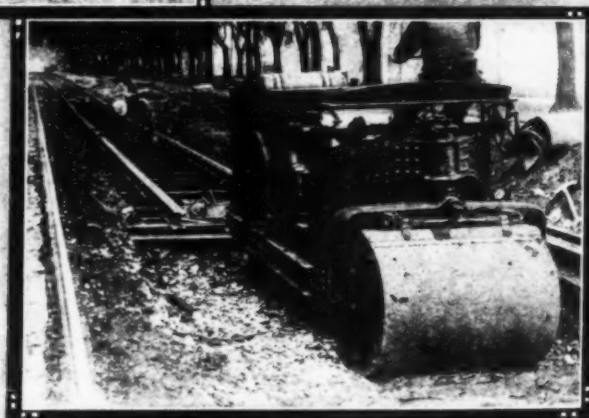
Motor Roller operating  
Austin Gyratory  
Crusher



Motor Roller  
on sub-grade  
in Florida



Pneumatic Scarifier attached to Roller



Tandem Roller rolling sub-grade for street car track

**R**OLLING a road is the easiest job a roller has to do. Most any roller will roll. But not so on the "extra" jobs—modern road builders want their rollers to supply power for other purposes when not rolling; it is here that the real test of a roller comes, on such work as

*Scarifying  
Road Grading  
Rock Crushing  
Road Hauling*

Austins not only do the rolling perfectly; they also give equal satisfaction when the extra load is put on.

## THE AUSTIN-WESTERN

Makers of:  
MOTOR ROLLERS  
STEAM ROLLERS  
SCARIFIERS  
ROCK CRUSHERS  
STONE SCREENS  
STONE ELEVATORS  
PORTABLE BINS  
QUARRY CARS  
STONE SPREADERS

CHICAGO

NEW YORK

BOSTON

PHILADELPHIA

MEMPHIS

ALBANY

ST. PAUL

OKLAHOMA CITY

RICHMOND

DALLAS

SALT LAKE CITY



# the Hardest Jobs

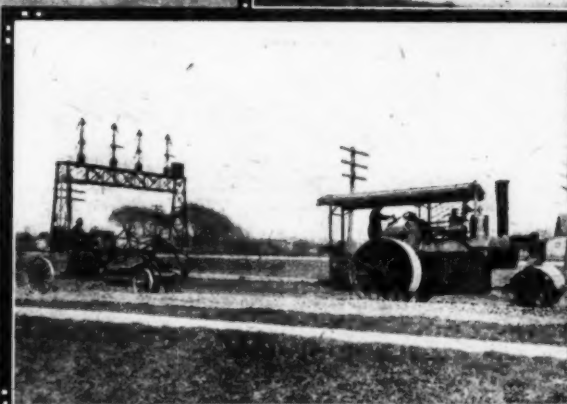
**P**OWER is a big factor in Austin roller performance. Not only power enough for ordinary work, but a large *reserve* to meet emergencies and for the "extra" work.

This is true of all Austins—Steam Rollers, Three wheeled Motor Rollers and Tandem Rollers, and from the Austin line you can select just the roller for your needs.

Write for roller facts and learn what Austin Rollers can do for you.



Steam Roller pulling  
Austin Steerable  
Scarifier



Steam Roller  
pulling Austin  
Grader



Motor Roller pulling Austin Steerable Scarifier



Motor Roller pulling crusher up Zion's  
Hill, Jerusalem



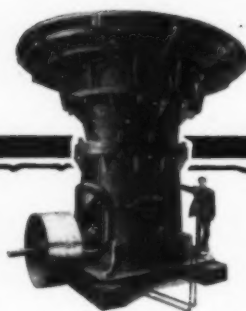
## ROAD MACHINERY CO.

### ILLINOIS

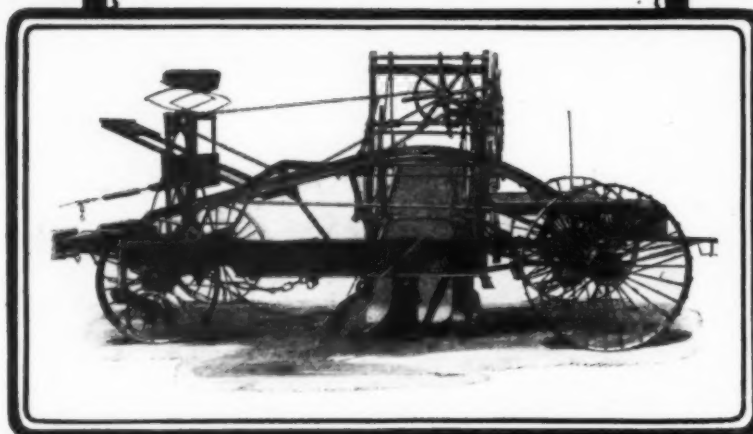
NASHVILLE	LOUISVILLE	LOS ANGELES	JACKSON
ATLANTA	PITTSBURGH	NEW ORLEANS	PORTLAND
COLUMBUS	SAN FRANCISCO		

### Makers of:

ROAD OILERS  
ROAD GRADERS  
ELEVATING GRADERS  
DUMP WAGONS  
STREET SPRINKLERS  
STREET SWEEPERS  
MOTOR SWEEPERS  
ROAD PLOWS  
WHEELED SCRAPERS  
DRAG SCRAPERS



Forming  
the  
Grade



Producing  
the  
Rock

## Two Fundamentals in Road Building

**T**HE contractor who has his rock supply assured and who can get his grading done on time has two of his biggest problems solved.

Austin Gyratory Crushers will produce the stone in the most reliable and economical manner. They are made in eight sizes, 50-5,000 tons daily capacity. Portable plants supplied.

The Austin New Era Elevating Grader has proved the most economical machine for excavating the road bed or forming the ditches. It will handle from 1,000 to 1,800 cubic yards of earth per day, either loading wagons or placing it on the grade, as desired. There is nothing new-fangled or experimental about Austin machinery. It has stood the test. Ask any owner.

*Write for catalogs and complete information*

**Austin Manufacturing Company**

New York

CHICAGO

San Francisco



*Canadian Agents: Mussels Limited, Montreal, Toronto,  
Winnipeg, Vancouver*



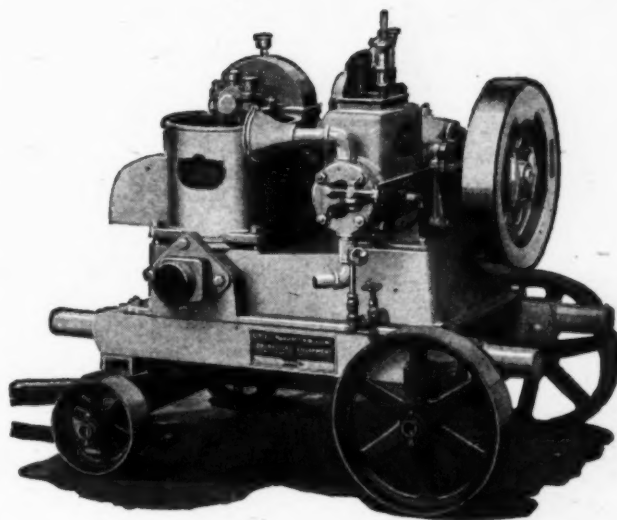
# On the Job

**I**F you have water to pump — this C. H. & E. Power Driven Bilge Pump will take care of your water troubles at the rate of 3000 gallons an hour with the No. 3 Pump and 6000 gallons an hour with the No. 4 Pump.

This outfit either on skid or truck is a very compact rig which can be placed anywhere on your work. Our catalog will give you more information.

*Write Us*

**C. H. & E. Manufacturing Co.**  
384-A Clinton Street .∴ MILWAUKEE, WIS.



EXPORT DEPARTMENT  
ALMACOA ALLIED MACHINERY COMPANY OF AMERICA ALMACOA  
51 Broadway, New York, U.S.A. - General Agents, New York



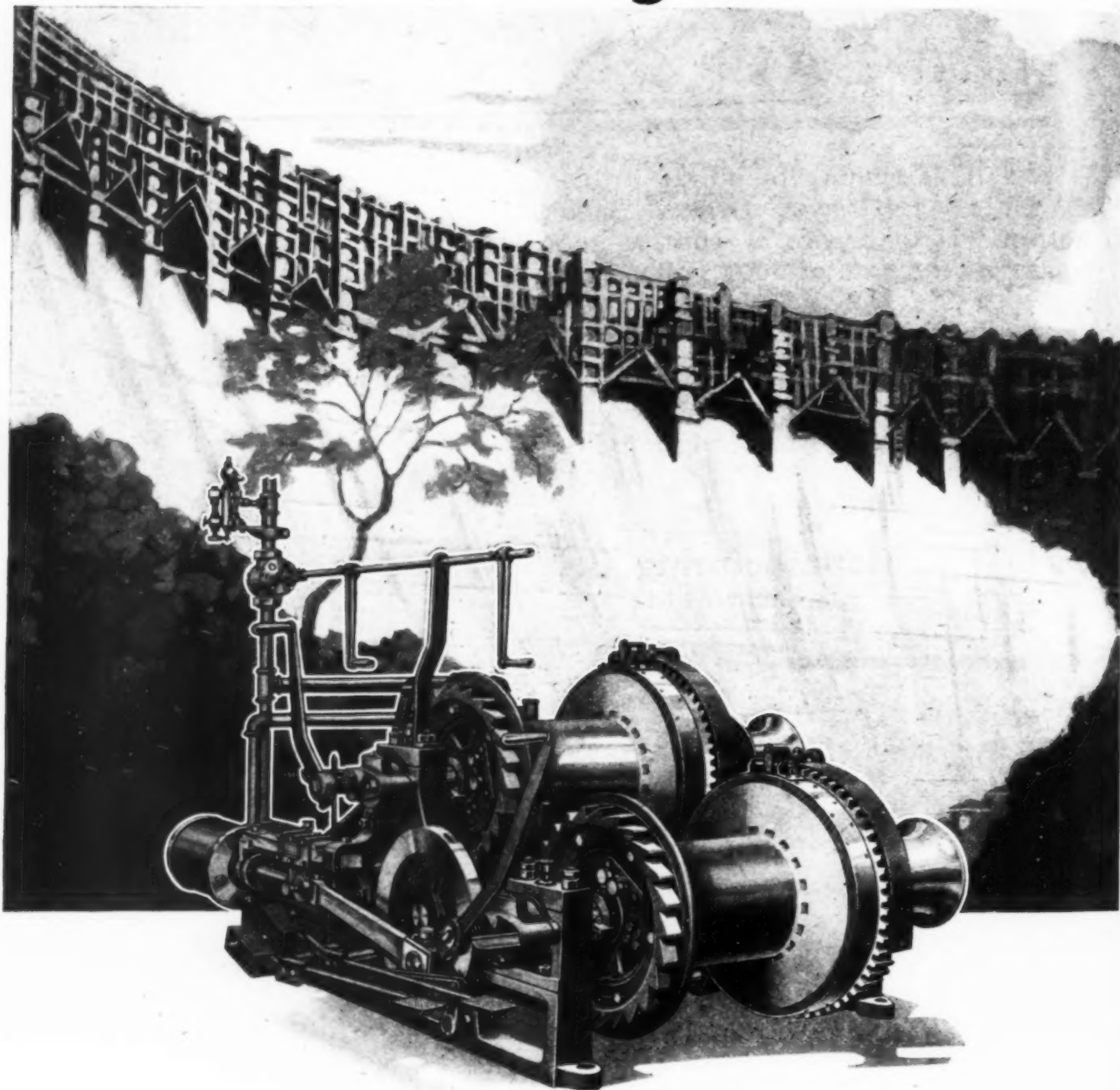
**MAKE NOTE  
OF THE  
NEW CAP  
OVER THE  
TOP OF THE  
PUMP TO  
KEEP THE  
WATER  
FROM  
SPLASHING  
OVER THE  
MAGNETO  
AND OTHER  
WORKING  
PARTS.**



**No. 4 Pump**  
6000 gallons per hour



# *What The Clyde Valve*



FOR years Clyde Steam Hoists have been used by contractors on the big outdoor jobs, such as dams, bridges, buildings and similar construction work. It is on the performance record of these hoists in use all over the world that the Clyde claims for superiority are based. The Clyde name is your guarantee.



*The*

**CLYDE**

*Representatives In Principal Cities~*

# Motion Means To You

**C**ORRECT design, proper materials and the most careful workmanship are the fundamental reasons for Clyde's enviable reputation.

On a steam hoist these three elements are most essential in the valve motion, and it is here that the real worth of a hoist is shown. You will find these properly balanced on the Clyde Steam Hoists.

The Clyde Valve Motion insures for you the utmost in steam hoisting performance.

*Note the Features Listed Below*

## Clyde Iron Works Sales Company

Duluth, Minn., U. S. A.

Sole Distributors for Clyde Iron Works

*Branch Offices and Warehouses:*

**NEW YORK**  
141-149 Centre Street

**CHICAGO**  
11 So. La Salle Street

**NEW ORLEANS**  
309 Magazine Street

**JACKSONVILLE**  
507 Hill Building

**SEATTLE**  
542 First Avenue, South

**PORTLAND**  
18th and Upshur Streets



1. Flanged spool rigidly held in place on stem by adjusting nuts, yet allowing valve free motion to seat without binding on stem.  
2. Lock nuts.

3. No adjustment of valve position except in steam chest where correct position can be seen and determined.

4. Eccentric keyed to shaft so it can not get out of correct position.

5. Bronze bushed pin.

6. Long babbitted guide on square part of stem.

# LINE

STEAM HOISTS  
ELECTRIC HOISTS  
GASOLINE HOISTS  
BELT HOISTS  
DERRICK FITTINGS

STEEL DERRICKS  
EXCAVATORS  
TRACTION CRANES  
BLOCKS and SHEAVES  
LOGGING MACHINERY



*A Clyde Man Will Call Anytime.*

B  
STANDARDIZED  
MATERIAL-HANDLING  
MACHINES  
G

# Think About

## Special terms for Spring deliveries

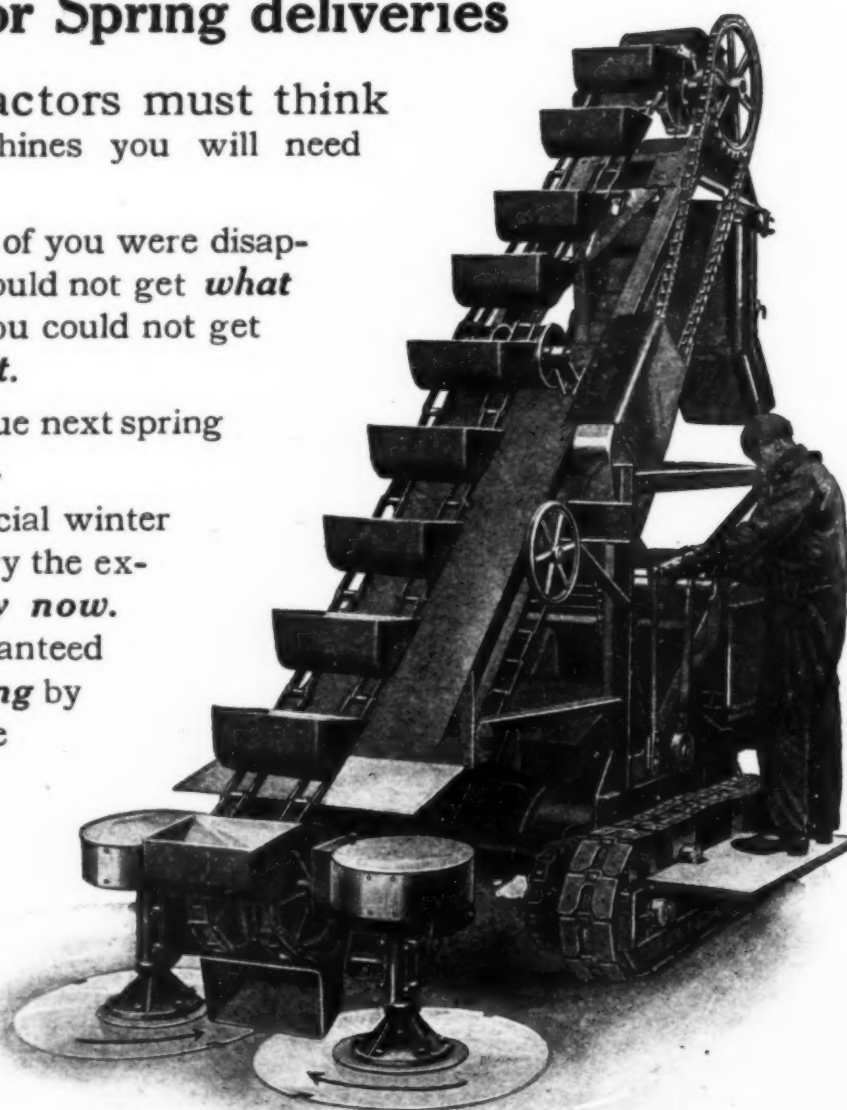
You road contractors must think *now* about the machines you will need next spring.

Last year hundreds of you were disappointed. Either you could not get *what* you wanted, or else you could not get it *when you wanted it*.

The same will be true next spring—unless you act now.

We are giving special winter terms to help you carry the expense *if you buy now*. And prices are guaranteed so you will gain *nothing* by waiting—chances are you will lose.

Ask about the special winter terms on B-G Loader for Road Contractors.



B-G Self-Feeding Bucket Loader

## Barber-Greene Company

AURORA, ILLINOIS, U. S. A.

BRANCH SERVICE AND SALES OFFICES:

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Buffalo  
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Indianapolis  
Pittsburgh  
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Milwaukee  
Minneapolis  
St. Louis  
Omaha

Birmingham  
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Kansas City  
Denver

Salt Lake City  
Portland  
San Francisco  
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Canadian Agents: *Mussens Limited, Montreal, Winnipeg, Toronto, Vancouver.*

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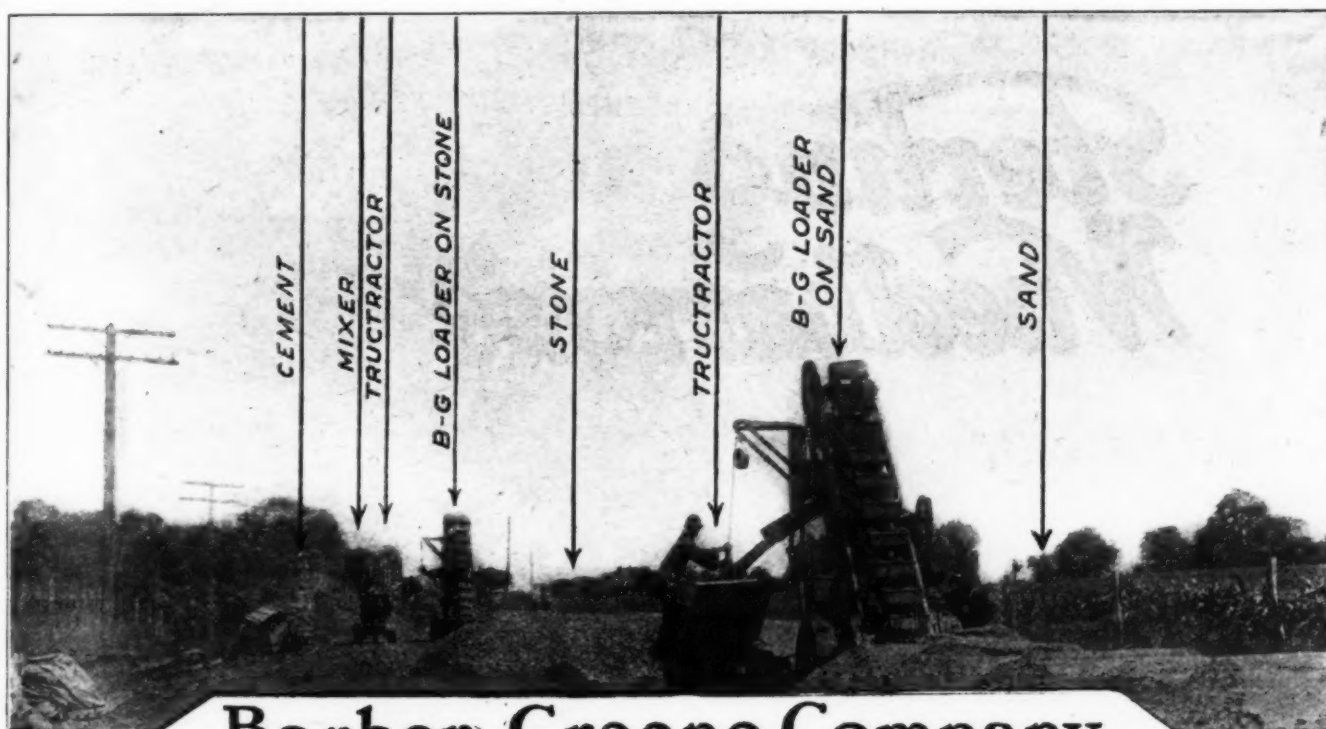
# Spring Now!

## Real facts and figures

Have you talked with a contractor who used B-G Loaders on his job last year? Have you found out how much money he saved by replacing five to forty men with loaders? If there was not a B-G job near you, let **us** tell you the experience of these contractors. The equipment is not extensive or expensive—the savings big.

We have made an extensive study of costs and find that Loaders used on road work last year more than paid for themselves.

Write for definite facts and figures. Let's get together now on your next year's plans.



## Barber-Greene Company

AURORA, ILLINOIS, U. S. A.

BRANCH SERVICE AND SALES OFFICES:

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*Sterling*

STERLING ON A WHEELBARROW MEANS

***Sterling  
Wheelbarrows*****Sterling Wheelbarrow Company**NEW YORK  
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ALMACO  
17 Columbus St. New York, N.Y. & Canada Branches New York

MORE THAN STERLING ON SILVER

*Sterling*

## Tell 'em at a Glance

- 1—by those red handles
- 2—by the ten-spoke wheel
- 3—by the clamped-on handles
- 4—by the lack of squeaks—the self lubricating bearings
- 5—by the riveted leg construction
- 6—by the flat leg bearing reinforced with the extra steel shoe
- 7—by the cotter-pin lock for the axle. No nuts or bolts to work loose

And by the all around service they never fail to give—"Ask the man who pushes one"



# Sterling Wheelbarrow Company

NEW YORK  
BOSTON  
CLEVELAND

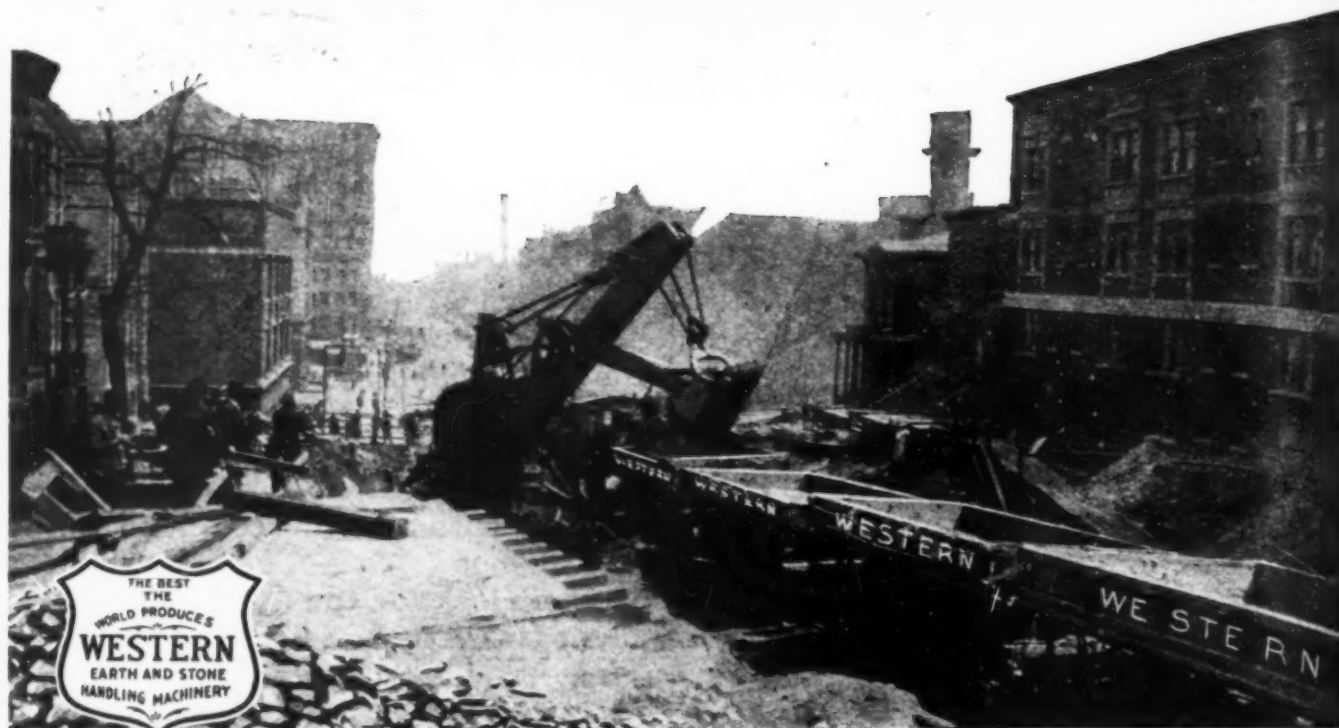
MILWAUKEE, WIS.

CANADIAN AGENTS: MESSERS LIMITED, MONTREAL, TORONTO, WINNIPEG, VAN COUVER

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## Why Western Cars? Here's Why!

A PENNSYLVANIA earth-mover, after using Western Dump Cars for 16 years, says:

"When I want a dump car I naturally think of a WESTERN car. It has always given good satisfaction; it is well built; its parts are easily procurable; and I have always found prices reasonable."

To meet the growing demand for larger loading units, in both industrial haulage and general excavation, we are building an improved 30-yard air dump car (either with automatic compression locks or with side chains.) Twin vertical air-cylinders equalize the dumping strain. The dumping device gives 34 per cent greater dumping power than any other dump car on the market.

The Western improved 30-yard cars are giving great satisfaction on the Mesaba Iron Range, where they are being installed in large numbers for heavy stripping, after a most rigid test under field conditions.



**Western Wheeled**  
Aurora,





## Plan Your Car Equipment Now!

**I**N planning your dump car equipment for the coming big season, begin your investigations and negotiations NOW.

Even should you prefer to wait for the expected contract before giving your final order, you can get the preliminary work out of the way this winter, so that a release order will start the Western factory to building your cars before the rush begins, and save delays when time is most valuable.

You will be pleased with the improved Westerns. They have all of the distinctive features of superiority, which have made Western cars standard the world over, plus the improved dumping device.

Western Air Dump Cars are built in five sizes—12, 16, 20, 25 and 30 cubic yards capacity.

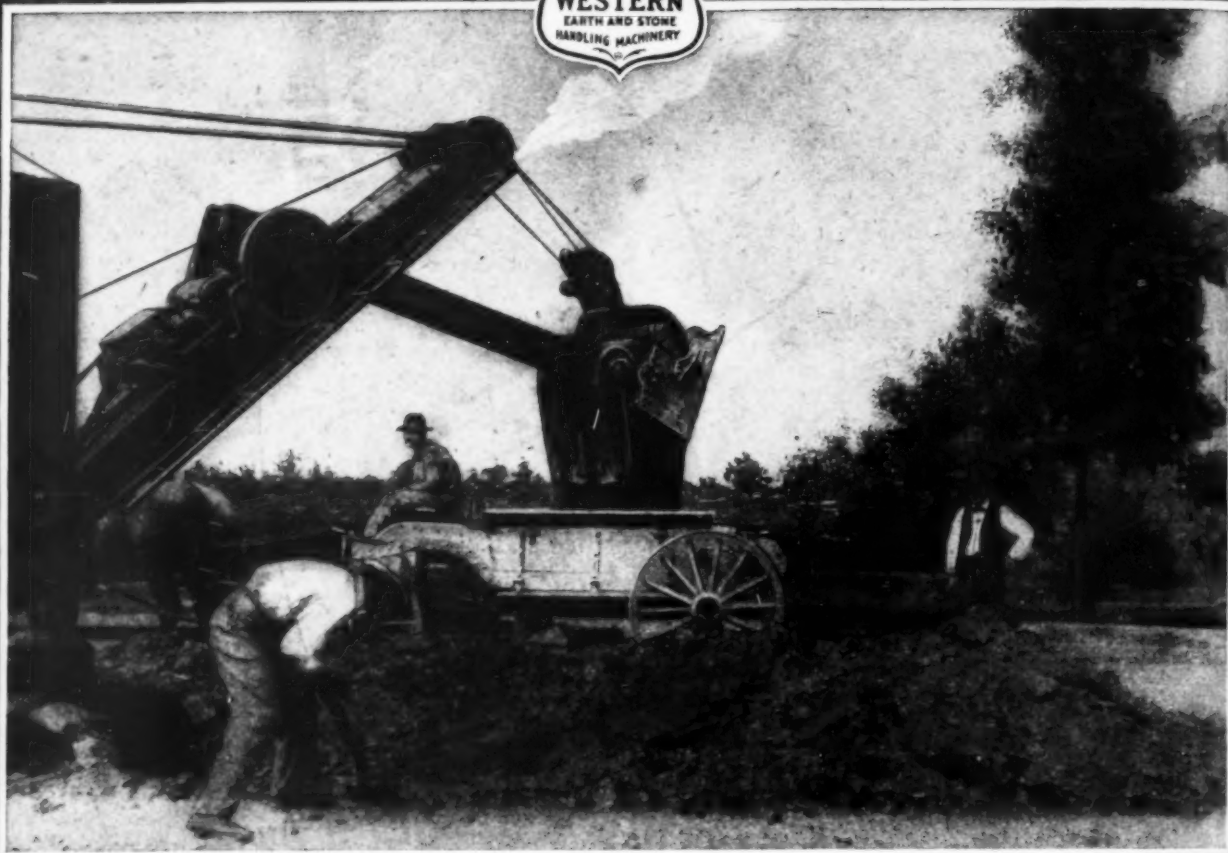
Your first step is to order the new Western Dump Car Catalog S51.

**Scraper Company**  
Ill., U. S. A.



WESTERN

Of Course



**"WHAT** wagons am I using? Why Western, of course. I wouldn't have any other on the job."

This Ohio road contractor was loading 15 Western 2-Yard Dump Wagons in 9 minutes. The Western Dump Wagon should be an indispensable part of every contractor's equipment.

### *A Few Points of Western Superiority*

- Can be operated by any boy who can handle a team.
- Dump the load instantly without stopping.
- Large dump opening. Two yards can be dumped in one place without coming in contact with wagon body.
- Built strong and light running. Easy on team.
- Bed remains in balance on uneven ground.

Whatever your contract you will need Western Dump Wagons. Compared with old-style stick-wagons they soon will save their cost. Contractors tell us they are the best all-around dump wagons on the market. Whether used with the Western Elevating Grader and Wagon Loader or with steam shovels, they will stand up under the hardest kind of use.

Send for new Descriptive Catalog S-46 Contractors' Equipment



## Western Wheeled Scraper Company

*Earth and Stone Moving Machinery*

Aurora, Illinois, U. S. A.

Founded 1877



# The Department Store Of Construction Machinery



A GROUP OF INTERESTED VISITORS  
AT THE CENTRE SEPT. 25, 1920



A time and energy conserving method of  
construction machinery and securing in-  
formation as to the work each machine does.

In New York City, a veritable department  
store of construction machinery—a complete service  
center where definite information concerning  
the machines of the following manu-  
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Trench Excavators and Back Fillers.

The Lakewood Engineering Company  
Industrial Haulage Systems, Concrete  
Construction Plants and  
Accessories.

A. B. Farquhar Company, Ltd.  
Portable, Semi-Portable and Stationary  
Steam Engines and Tractors.

Sterling Wheelbarrow Company  
Wheelbarrows.

The Wyoming Shovel Works  
The "Red Edge" Hand Shovels.

Western Wheeled Scraper Company  
Earth and Stone Handling Machinery.

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Western Wheeled Scraper Company  
Earth and Stone Handling Machinery.



**Construction Machinery Centre**  
100 Centre Streets New York City

# THE PARSONS CREED

## **FIRST—**

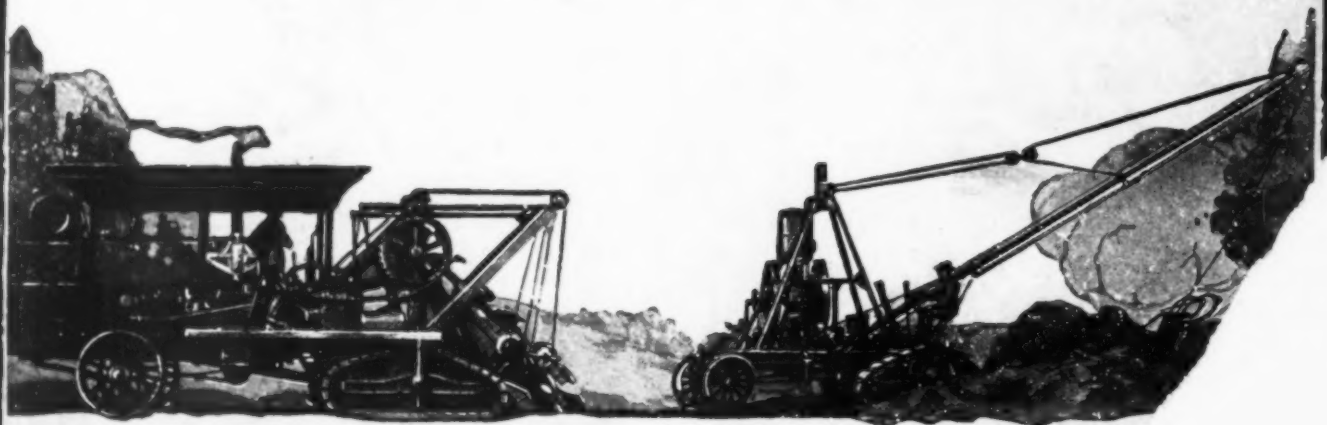
Real trenching service to Engineers and Contractors.

## **SECOND—**

Supplying of excavators and back-fillers of built-in sturdiness.

Naturally our bread and butter comes from the sale of equipment—but the field has come to know that Parsons will not recommend or urge the purchase of equipment where machine digging is not practical.

We value our good name and our reputation for rendering real trenching service. Consult us with your problems—if you do, it will cost you nothing—if you don't, it might cost you the otherwise profits on that job.



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